A McGraw-Hill Publication
San Francisco, Calif.

November 1, 1926
25 Cents

Journal of Electricity

Devoted to the Economic Production and Commercial Application of Electricity
IN THE ELEVEN WESTERN STATES

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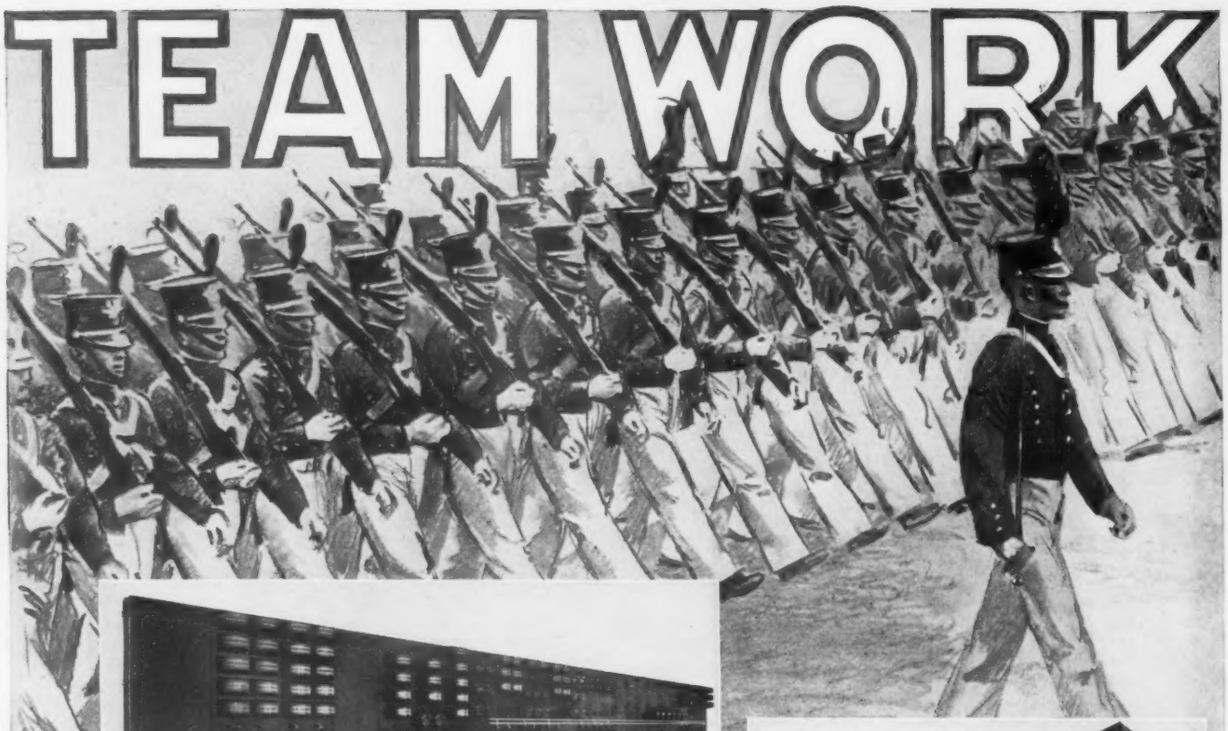

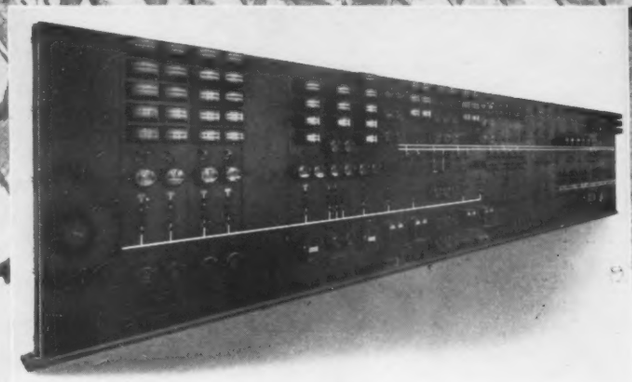

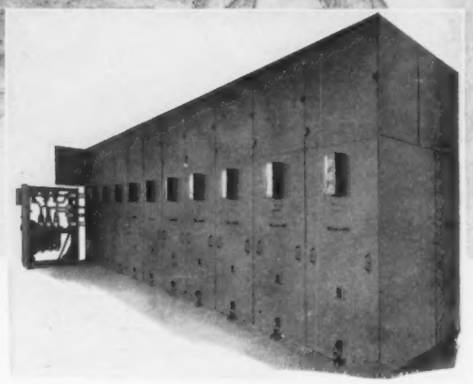

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Devoted to the Economic Production and Commercial Application of Electricity

IN THE ELEVEN WESTERN STATES

A McGraw-Hill Publication

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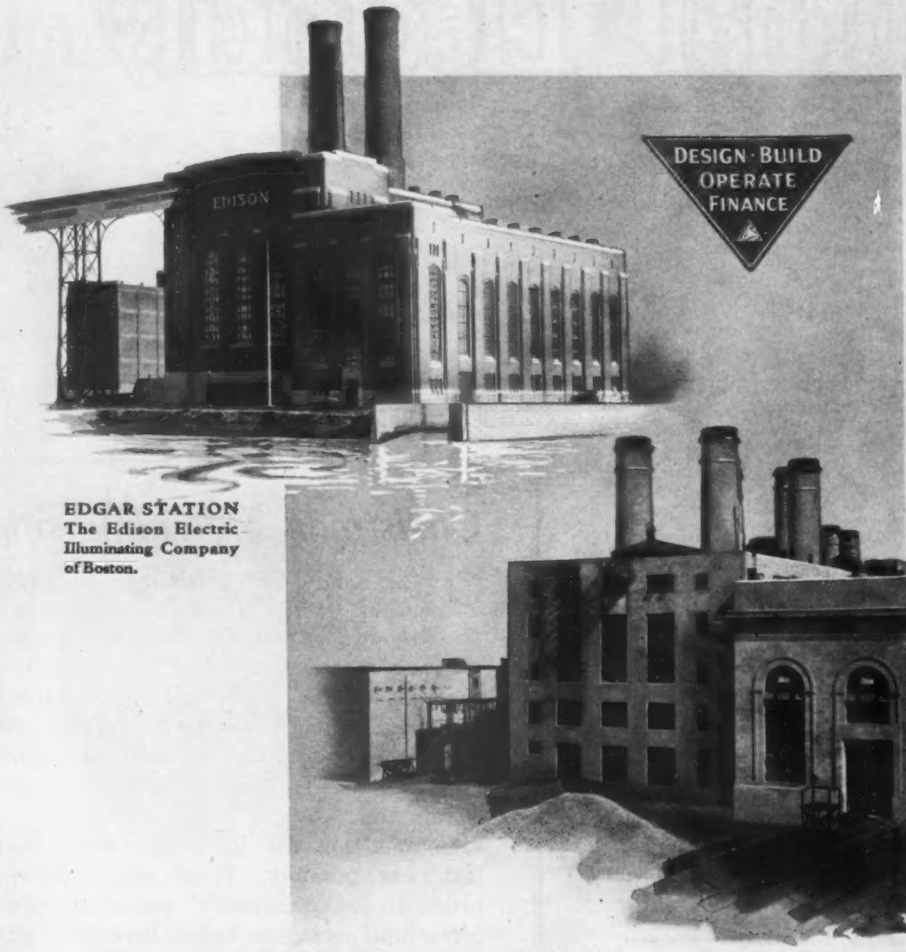
Christmas Merchandising

ONCE more the Christmas shopping season opens. Once more electrical merchandise should constitute a large percentage of the Christmas gifts given in these electrified eleven Western states. Once again the live merchandiser will have an opportunity to build up sales, good will, and establish himself in his community.

Competition will be keen, keener than last year, possibly. Every manufactured product even remotely connected with gifts and giving is being brought forth as something to be given this Christmas. It is no time for the merchandiser to sit back and rest upon his laurels. Merchandising profits will go only to those who work for them.

Interested in rendering genuine sales service to its merchandising readers the Journal of Electricity in its Better Merchandising section will present attractively and succinctly in the next issue, that for Nov. 15, complete Christmas selling plans and ideas. The most effective selling ideas of last year will be reviewed. A number of new ideas in selling for this year will be offered. Photographs of clever and result-getting window and store displays will be reproduced that others may adapt them to their uses.

The Christmas merchandising service has now become an annual feature of the Journal of Electricity. This year it is designed to be more useful to you than ever before.



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STONE & WEBSTER built both in 1925.
Now doubling the power for both clients.

STONE & WEBSTER
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NEW YORK, 120 Broadway
CHICAGO, First National Bank Bldg.
PHILADELPHIA, Real Estate Trust Bldg.
SAN FRANCISCO, Holbrook Bldg.
PITTSBURGH, Union Trust Bldg.

EDITORIAL

The Ridiculousness of of the Superlative

SUPERLATIVES have little credit, except once in a while. The "largest" this or that and the "first" something else seems always destined to fall into the class of "one of the" largest or first when someone builds larger or discovers that his particular accomplishment antedates the other fellow's by fifteen minutes and six seconds. Among central stations there seems to be a particular complex which almost demands that there be something without paragon about each system. Particularly when boasting of achievement is the statement likely to be made that a certain company possesses either the first, longest, highest, largest or earliest something or other. As time passes, in order to keep the sovereignty, these record achievements begin to carry modifiers until they become ludicrous, if not almost meaningless. Which reminds us of a small company which many years ago started out with a "world record" span. As time passed the record dwindled until, if it were to be superlative at all, it was spoken of as the "longest span under 25,000 volts across a body of salt water in Blank County." Today if the span were to be classed among the "records" the company would have to add to the description "painted blue."

For Sounder Development of Electric Refrigeration

WHAT about electric refrigeration? This latest contribution of the industry for the betterment of mankind has swept the country like wildfire. What might be termed the first year's effort of the industry to sell this latest service is almost over. There have been many trials and tribulations; conditions have been far from stable; lessons have been learned that will have important bearing upon the future development of this great field.

In an effort to bring to bear the best thought and experience of the industry both to assist in the stabilization and to guide future development, the McGraw-Hill electrical papers have conducted a nation-wide survey. Men in all branches of the industry were interviewed personally in more than 200 cities. A mass of data, facts, opinion and experience has been gathered, tabulated and analyzed. The situation as it exists in the Western states is presented on another page of this issue. Comparisons are made between Western and national conditions, but the national situation is discussed at greater length in Electrical World.

It may be surprising to Western men to know that in comparison with other sections of the country a poor job has been done in this territory. There have been many contributing factors—too many to set down here. The fact remains that with a territory which often has been referred to as one of the most fertile fields for this latest electrical application, the industry has not made the best of its opportunity. The reasons are discussed in detail in the article in this issue. Conclusions are drawn from the facts and opinions of the men interviewed which may serve to improve the job next year. These are offered to the industry for what they are worth.

Despite the difficulties experienced by the industry in the Western states as reported in the survey, there is a definite feeling of optimism regarding the prospects for 1927. Sales quotas double and treble those of the past year are reported. Moreover there is an unanimity of feeling that the experience, bad, good or indifferent, gained during the current year will more than offset the poor showing made and will enable central stations, distributors and dealers to meet the new quotas.

Opportunity is taken at this time to thank publicly the hundreds of men in utilities, distributors' and dealers' organizations who have made this survey possible. Without the hearty co-operation of these men the survey could not have been made. The industry owes a debt of gratitude to them for the manner in which they gave freely of their time, experience and opinion in the hope that refrigeration development may be put on a sound, constructive and profitable basis.

The Five Commissioners Named by the Proposed Housewives' Bill

THE Housewives' Council of Portland in its initiated water and power bonding amendment to be voted upon by the people of Oregon on Nov. 2 gave the voters some satisfaction when it named in the measure the commission of five who would administer the $52,000,000 to be raised for the purpose of engaging the state in the business of developing and selling electric energy. The people of the state are indebted to the "Oregon Voter'" for brief biographical sketches of these proposed commissioners in which the training and experience of each candidate are set forth fully. We are indebted to the same publication for the excerpts from these biographies which are presented here for the information of the electrical industry.

The first commissioner is an automobile and radio dealer with a business college education and a general mercantile experience. He is reputed, according to the "Oregon Voter," to have filings on the

waters of Clear Lake, a body of water which has possibilities from a power-and-water-supply standpoint. The second candidate is a retired farmer and dairyman, seventy-four years old, a former member and president of a small-town water commission and active in civic affairs. The third is a fertilizer salesman, ex-farmer, former member of the state legislature and once candidate for governor. The fourth, a woman, has been active in community affairs in Portland, a former school teacher and one of the leaders in the movement to secure the franchise for the women of Oregon. She is chairman of the research committee of the Housewives' Council and has long been a student of utility rates. The last member is secretary-treasurer of a laundry company, has been active in both city and state politics for many years and has been a "persistent, visionary, denunciatory and recurring advocate of municipal ownership."

The people of Oregon are allowed no opportunity to select as members of the commission those whom they might deem best qualified from the standpoint of previous technical and business experience. It is doubtful if they will entrust the sum of $52,000,000 to the administration of the body named. At least such should prove a good talking point for those who are opposing the proposed measure.

"The Nation" and its Russian Love Affair

AS long as that provocative mouthpiece of the sad, fierce thinkers, The Nation, confines its introspective gaze to intellectual and cultural topics, it is an interesting and sometimes amusing periodical. To those who can take their "Nation" or leave it alone it affords a view always contrary to the accepted view and as such provides exercise for the active mind, willy-nilly.

Yet when the very serious and very sarcastic young men who write for that journal of radical thought take it upon themselves to speak of facts and of matters pertaining to actual working institutions, they do what all people who wade in beyond their depth do, namely, they flounder about in a highly comical manner. Their antics, particularly with respect to high-sounding criticisms written in an abused tone of the so-called "power trust," invented by them and blamed with all sorts of dire things in past Water and Power Act campaigns, are antics of the schoolboy thrown into a fright by a Hallowe'en spectre.

It is with amusement, then, that one reads in the Oct. 6 number of The Nation the editorial "Hugh Cooper Touches a Dream." The dream, it seems, was Lenin's; therefore, it must have been quite a dream. Anything Lenin dreamed was perfect, if one is to take The Nation seriously, and strange as it may seem, there are people who do.

How is the dream coming true? Hugh Cooper, American electrical engineer, backed by American capital—even so—has gone to Russia and there obtained important concessions. He has built and will build a number of large hydroelectric projects for the Soviet government. It is the fulfillment of Lenin's dream and all that sort of thing. And because it is being done for the Soviet Union it is somehow a noble and a holy thing.

As usual The Nation does a double somersault in the last paragraph. How wonderful this blazoning of Russian villages with light, it says, with foreign commercial agents selling turbines and apparatus, while the United States "tries to sell Muscle Shoals and other American power projects to gentlemen whose primary interest is to make money out of them."

Really, now, just what are the gentlemen who sell generators to Russia selling for? What purpose, is one to suppose, moves the gentlemen who are loaning money and financing those projects in Russia, operating under Soviet concession? Surely these are gentlemen whose primary purpose is to make money out of those projects. And yet, because they are doing this "for Russia," is it that somehow their transactions are ennobled and enshrined in miraculous ways? Aren't the editors of The Nation just a bit ridiculous?

For some years this strange love affair has gone on. The Nation, saddened and burdened with American idiocyncrasies—and America has them no less than Russia perhaps—has devoted itself most assiduously to this rougher sweetheart, one with fire in her eye and ideas in her head.

Like all lovelorn swains, The Nation loves on blindly. Anything Russian is something superior, something exalted. Hence, when Hugh Cooper builds power projects in the land of Soviet—and in justice to Mr. Cooper the projects he is building will rank among the finest in the world and render a great public service to Russia—albeit he and his companions shall derive from them profit for themselves, The Nation considers them more important by far than any of the more truly communal customer-owned enterprises in its own nation, America.

In another column of this same Oct. 6 number The Nation goes into raptures over the fact that union workers in New York are building their own apartment houses. What essential difference is there in customer-owned utility building of power plants, except that the utility is owned by all classes of people, workers of brain as well as of brawn, instead of just of one single class?

There is really considerable to fall in love with in America, too.

Governor Hunt Displays His Superiority Complex

WITH the new science of psychoanalysis what it is, a brave person indeed it is who exhibits his complexes to the naked eye. The least aberration from what is known as normal lets one in for a searching analysis of hidden motives, influenced, it is said, by some untoward event in his childhood days.

Be that as it may, Governor Hunt of Arizona seems to fling to the winds possibilities of such analysis of his motives, for in a recent press report he is said to have declared the entire Boulder Canyon project dependent upon his aye or nay.

"As long as I am governor," he is quoted as saying, "no dam shall be built at Boulder Canyon. Arizona has 43 per cent of the watershed and furnishes 23 per cent of the water in the Colorado, and California, furnishing none, shall get none."

The picture which comes to mind on reading such a statement is one of Governor Hunt, arms akimbo, standing in the gorge at Boulder Canyon whose sides tower 1,000 ft. above him, defiant and resolute, a Canute commanding the tide to cease, shrieking, "They shall not pass." The spectacle is somewhat disproportionate to Governor Hunt's real importance, and no doubt your good psychoanalyst seeing it would smile knowingly and murmur, "Gottmensch complex."

Moreover, if the attitude is to be interpreted as a reflection of childish events, it is not surprising. The entire attitude of Arizona, through its mouthpiece Governor Hunt at least, has been extremely childish. It is the dog-in-the-manger attitude translated into political bonfires.

It is to be regretted by every adult—as opposed to childish—individual that the development of the Colorado, a man-sized job, and the protection of Imperial Valley from flood danger, a truly grown-up responsibility, should be delayed.

The Poet of Power, Charles H. Peirson, Passes On

"CHARLIE" PEIRSON, as he was known to the "Fourth Estate" throughout the West, passed on, Monday, Oct. 18, and brought to an end a romance which was not to be rivaled by any of those his imagination had created from the story of the development of electricity. Though himself the poet laureate of power development, the creator of the concept, "white coal," his own story from the time he began his writings at 12 years of age, through his experience on many newspapers as reporter, special writer and war correspondent, syndicate writer and poet, besides the very successful job of acquainting the world with the meaning of power development, was itself no less a vivid though unwritten romance.

The electrical fraternity, of whom he sang praises through every newspaper in the country, was not as well acquainted with Charles Heston Peirson, assistant vice-president of the Southern California Edison Company and for more than twenty years that company's director of public information, as was the newspaper fraternity of the country. This in itself is a remarkable characteristic. The interpreter of the electrical industry to the public was less known to his industry than to the public. Yet the industry's debt to him is no less great, rather it is a more real debt in every sense.

Those who are gifted with the imagination, the sense of values, as well as the faculty of expression, to translate the mechanical—and to some of us—unromantic, details of every day into terms of achievement and drama, are rare indeed. Often they are an institution's most productive agents. They write down their industry's activity in terms that the average person may understand and imbue it with interest and the glamor of romance. Thereafter, in the light of the interpretation these individuals are able to give to the ordinary deeds of an industry, these works are seen by that industry itself as accomplishments of which its members may be proud.

"In the passing of Mr. Peirson our corporation and, indeed, California, has lost one of its most constructive influences in its development," said John B. Miller, president of the Southern California Edison Company. In these words he expressed an universal opinion.

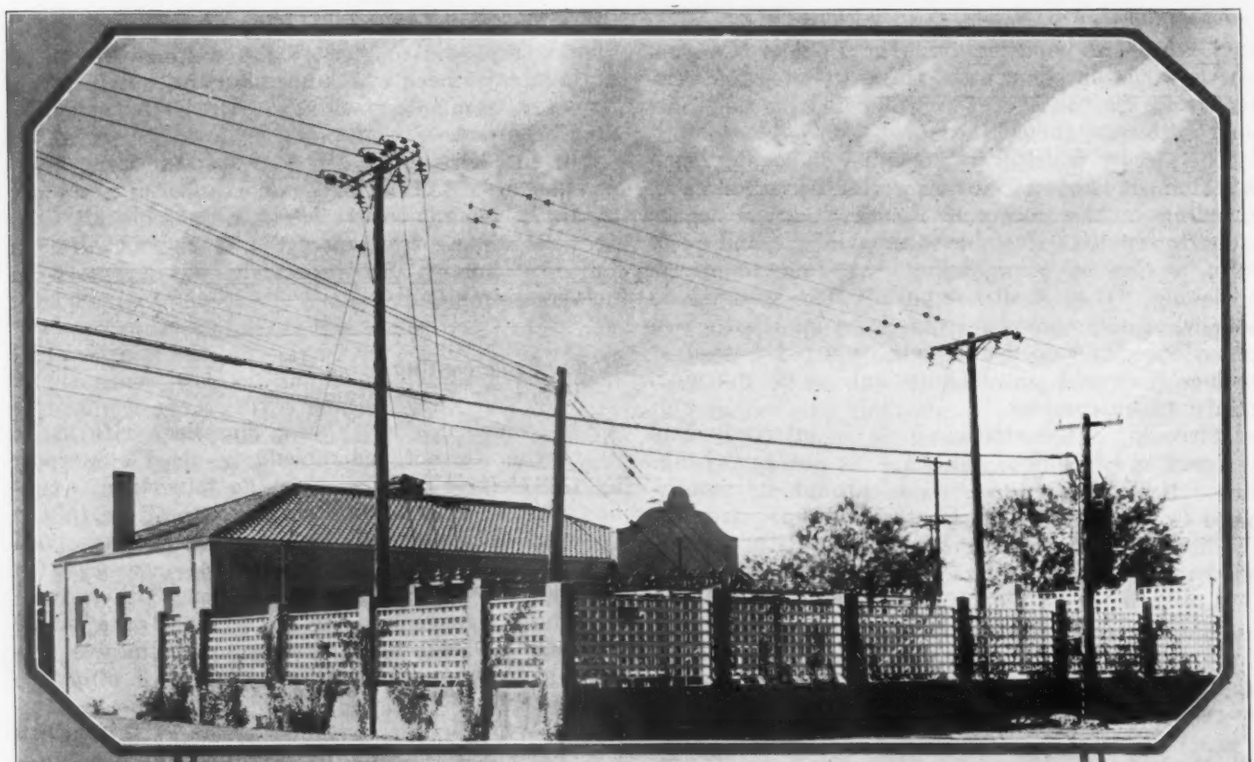
Radio Broadcasting from a Public Relations Standpoint

FOR some time speculation has been rife as to whether or not radio could be used effectively by the electric utilities from an advertising, publicity or public relations standpoint. Here in the West sporadic attempts at broadcasting have been made by one or two utilities, in one instance with considerable favorable public reaction. Others have considered broadcasting as an adjunct of a public relations program but for some unaccountable reason have done nothing. These can well afford to take a lesson from the New York Edison Company. What broadcasting has meant to this utility was explained recently by Arthur Williams, vice-president in charge of commercial relations. Mr. Williams said:

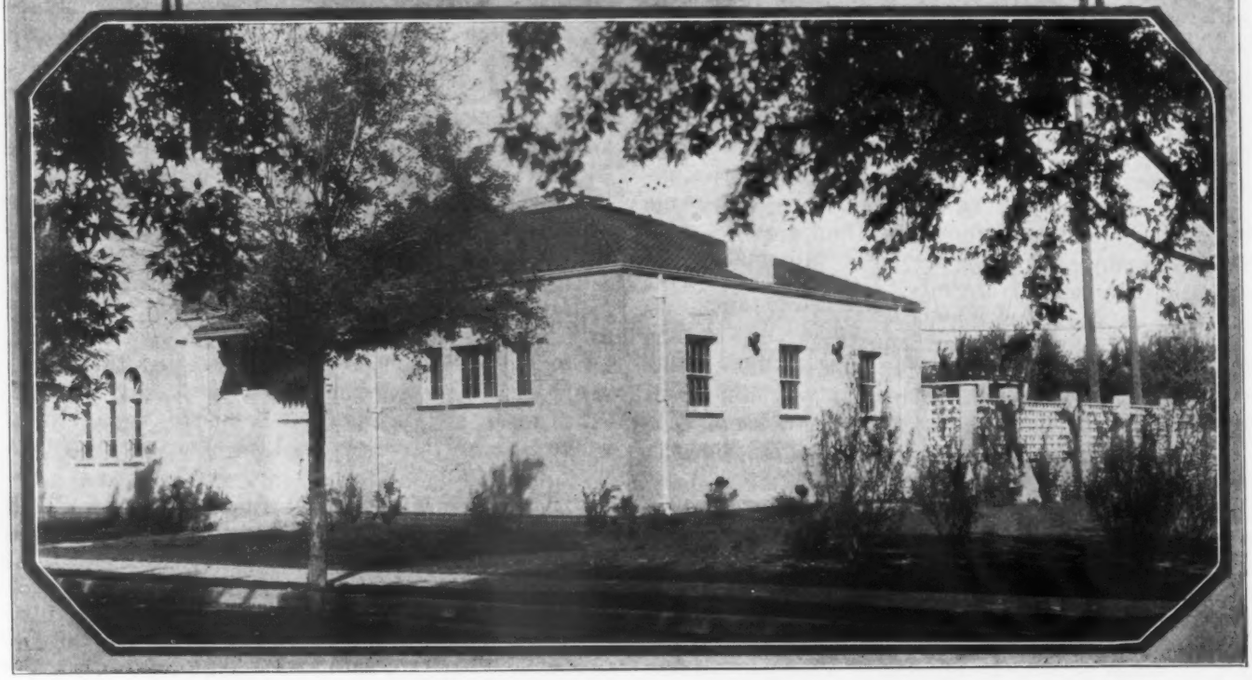
"Through the utilization of the radio and the establishment of the Edison Hour, the company is seeking to restore, at least in part, the former personal relation which was possible with all of its customers when the number was comparatively small. This, of course, cannot be accomplished as fully as the company would desire. But to a certain extent the radio gives opportunity to explain the various phases of the company's service, and its desire to keep in closest possible touch with its customers and the public, in the hope of establishing, through mutual effort, the highest standards of service.

"In all of this there is no thought of advertising. The broadcasting program of the company has been kept entirely separate from its advertising, in the belief that the newspapers of the city provide by far the best advertising medium. In fact, during the past year the company's advertising appropriations have been increased, rather than reduced because of its broadcasting activities. The company feels that its own use of the air should be confined to education and entertainment, recognizing that, through the Edison Hour, it is entering the homes of its customers and the public, in at least a sense, as a guest and it does not wish to do anything which might be considered as trespassing upon their hospitality."

The recent announcement that the Standard Oil Company will take up broadcasting, as well the success enjoyed by other companies that have entered this field, can be taken as an indication of the trend in this direction. At any rate, utility executives can afford to give the subject of broadcasting more than a passing thought.



ONE of Denver's nicest appearing residences proves to be a modern substation. Appearances are being taken into consideration more seriously in the construction of substations than ever before in the history of the electrical industry. This is a creditable step in the progress of the industry and one that is in keeping with a sound policy of public relations. A substation with suitable landscaping that is an addition to the beauty and attractiveness of a community is a proof of sincerity readily understood by the general public. Harrison substation of the Colorado Public Service Company, shown from the front and rear in the accompanying views, is an unattended station providing regulated residential service. Circuits are arranged for self-reclosing.



Status of Electric Refrigeration in the Western States

IN comparison with conditions brought out in a national survey conducted by McGraw-Hill electrical papers, refrigeration development in this territory is below the average. Lack of stabilization, weaknesses in the distribution set-up and troubles with machines contributed to the failure to secure a higher volume of sales. Better selling, closer factory inspection and more careful installation will be needed if sales quota is to be reached in 1927.

"WRITE off 1926 to experience. The lessons we have learned will enable us next year to do the kind of a job we had hoped to do when we tackled electric refrigeration last January." These words from a central station executive aptly sum up the present Western attitude toward refrigeration and in a measure indicate that all was not sugar and honey during the months past, either from the standpoint of the electric utilities or from that of the manufacturers, distributors and dealers in the territory west of the Rockies. Electric refrigeration has met with the same general public acceptance in this territory that it has been accorded nationally but the only partial effectiveness of the industry's sales efforts, coupled with trials and tribulations with machines and a relatively high sales resistance attributable to a number of causes, have militated against a volume of sales comparable with that of other sections of the country.

Because of the popularity and rapidly broadening market and because of the instability of sales, servicing, financing, production and distribution practices, the editorial staffs of the McGraw-Hill electrical papers, including the Journal of Electricity, Electrical World and Electrical Merchandising, set out to make a nation-wide survey of the refrigeration situation as it exists today. More than 200 cities were visited personally by members of the staffs of these publications to obtain first-hand information from utility executives, commercial managers, sales and service men, distributors, and retail outlets. The co-operation of these men has made possible the assembly of a mass of data, facts, opinion and experience which it is hoped will help to put the development of electric refrigeration on a sound, profitable and constructive basis. The national situation is covered in the Oct. 30 issue of Electrical World. This discussion refers specifically to conditions in the eleven Western states and makes only an occasional comparison with the national situation for purposes of emphasis.

Extent of Survey

In the Western states practically every city which is the headquarters of a central station serving 5,000 or more customers was visited, as well as a number of cities and towns on the lines of those companies. Nationally more than 25 per cent of the customers of the power companies were included in the territory surveyed. In the West the percentage was considerably higher.

The most significant fact brought out in the survey was the remarkable unanimity of opinion among central-station men as to the desirability of electric refrigeration from a load and revenue standpoint. Opinions differed considerably, however, as to the desirability of central stations merchandising refrigerators, as to sales methods and policies, servicing, distribution set-ups and the manufacturers' sales and servicing help. These differences in opinion, together with the cautious attitude displayed by the majority of power companies in California where the greatest field for refrigeration exists in the West, contributed to the poor showing which this section made in comparison to the East, South and Middle West.

A study of the refrigerators in use at the time the survey was made, Aug. 15, 1926, shows that the average saturation among domestic customers nationally was 1.78 per cent. The degree of saturation for the four geographic divisions follows:

East	2.00 per cent
South	2.41 per cent
Middle West	1.70 per cent
West	1.15 per cent

The contributing factors for the comparatively poor showing in the West will be discussed later.

Actual sales in this territory for 1926 as accurately as can be determined from the survey will approximate 15,820 domestic machines and 2,160 commercial machines. For the first seven and a half months of the year the national survey shows that total sales in the Uiited States were in the neighborhood of 165,287 domestic units and 27,279 commercial installations. Conservative estimates of the year's total sales show that approximately 250,000 domestic and commercial units will have been sold by Jan. 1, 1927. Thus the West, with its total sales of 17,980 units, will have sold only 7.2 per cent of the total for the year. In view of the fact that 14 per cent of the total electric consumers of the country is located in this territory, the showing with respect to electric refrigeration is not particularly impressive.

Attitude of Central-Station Executives

Every central-station executive in the Western states expressed the most vital interest in the subject of electric refrigeration. Little need exists to sell these men on the value of the load. With the exception of California, practically every power company is engaged actively in the merchandising of domestic machines, The big problem that seems to be confronting the central station is whether or not they should sell refrigeration. Some executives are inclined to the belief that they should stay out of the business so long as the distributors and dealers do a good selling job. They recognize the desirability of the load and realize that the power companies must place their stamp of approval upon refrigeration, but they prefer to do this through co-operation with existing outlets. However, all express a readiness to step into the business the moment they are convinced that the dealers are failing to secure what they consider a satisfactory volume. Their feeling is that so long as the dealers, distributors and manufacturers keep their promises to sell electric refrigeration service and not merely refrigerating machines, then a satisfactory selling job will have been done.

There are other central stations in this territory that have had experience in the merchandising of all lines of appliances that feel that they can speed up the volume of sales by going into the business themselves. Where these have studied the situation carefully and have organized adequate sales and service forces a fairly good job has been done.

A third group was swept off its feet by the possibilities of the refrigerator market. The overenthusiasm of the members, coupled with unstable production conditions during the early part of the year, and the fact that they were not properly organized to sell and service, have resulted in troubles which have wiped the year off the map as far as refrigeration on their lines is concerned.

One of the criticisms of the central stations voiced by distributors and manufacturers' representatives has been that their over-cautiousness has retarded progress considerably. However, the executives at whom these criticisms are directed are equally sure that they are the better off for not having rushed into the business and point to several other companies that have had unfortunate experiences.

Many executives voiced the opinion that servicing costs are too high in proportion to revenue received. Very few had accurate data to substantiate this belief. Others expressed the opinion that losses incurred were to be expected in view of the fact that they were pioneering a new device.

In the Pacific Northwest executives pointed out that they could not be criticised for seeming lack of enthusiasm in pushing the business in view of the extremely low rates for service in that territory. Admitting that electric-range consumers were the best prospects on account of their familiarity with bills showing a high kw-hr. consumption and with a considerable initial outlay for appliances, these executives stated that, whereas the annual revenue from a refrigerator in other sections of the their systems this average would run from $6 or $7 to $15 or $16 depending upon the existing saturation of ranges. Some refrigerators would be served at rates as low as 1½ cents per kw-hr.
country would average between $25 and $35, on

Relations with the Ice Industry

While cognizant of the spread of electrical refrigeration the ice industry is not agreed upon the effect it will have upon that business, nor upon a policy to meet the situation. Perhaps the ice man realizes that by a more aggressive sales policy, profiting by the advertising done on the general subject of refrigeration, he may be able to increase his business in a field heretofore not reached.

In two cities it is reported that the ice business actually increased this year, and it is logical to suppose that the contention of the electrical refrigeration people, that this has been due to the impetus given to refrigeration by advertising electrical machines, is true.

In two of the cities in this territory leading ice dealers have taken on a line of electrical machines, and one of these is securing more than a fair share of the mechanical refrigeration sold in that city. In sceveral instances a bitter controversy through advertisements in the newspapers was started between a refrigeration dealer and an ice manufacturer. In each city this advertising controversy threatened to hurt both businesses. An executive of a utility company in each case acted as mediator, pointing out the dangers of the controversy and bringing about peace between the contending parties.

Throughout the territory the central station has done everything possible to protect the ice man's interests. Uniformity of viewpoint in this respect was noted in every locality served. The keynote of the general policy to be followed in relations with ice dealers was sounded at the meeting of the Commercial Section of the Northwest Electric Light and Power Association last March. Among the tenets of that policy were: that advertising should be clean and direct; that machines should be sold on their merits and not through indirect reference to the ice business in a derogatory way. These policies seem to have borne fruit.

In certain sections of California overtures of the utilities to the ice people have been fruitless. A group of ice companies still persists in running pernicious advertising in the newspapers and has gone so far as to take on a line of inferior ice boxes which it is selling to prospective customers at cost. The efforts of the electrical industry to show these men that electrical refrigeration is progress and that any advertising done in the name of refrigeration will be beneficial to both sides have been or no avail. On the whole, the electrical industry is most desirious of preserving harmonious relations with the ice men.

Refrigeration Sales Outlets

The greatest success from the sale of refrigerators in this territory has been enjoyed by the dis-

tributor-dealers, that is, distributors which might also be termed factory branches maintaining extensive retail selling organizations. Approximately 50 per cent of the domestic units sold have been distributed through such channels. Central stations and specialty dealers selling refrigerators alone, or along with some allied line such as ranges, water heaters or oil burners, have each sold approximately 20 per cent of the total, and the remaining 10 per cent has been sold by the electrical contractor-dealers, a few department and furniture stores and one or two miscellaneous dealers.

The national survey shows that 40 per cent of the domestic units was sold by distributor-dealers; 32 per cent by central stations; 16.7 per cent by specialty dealers and 11.3 per cent by contractor-dealers, furniture stores, department stores, etc. The major proportion of the commercial units has been sold by distributor-dealers and specialty stores. Specialization is one of the requisites for the sale of commercial refrigeration. Unless the dealer or the central station has specially trained men in commercial refrigeration, neither has had much success in this field. Several central stations, however, have had their power salesmen co-operate successfully with the commercial refrigeration salesmen of the distributor-dealers.

Sales Methods Used

One of the greatest weaknesses in this territory has been the ineffectiveness of the sales organization set-up. Competent salesmen have been scarce and difficulty has been experienced in training the few good men available. Distributor-dealers have been the most successful in this respect as they have been able to conduct special training schools with factory men as instructors. Central stations in the territory merchandising refrigerators realize that in the majority of cases specially trained salesmen must be used and that they cannot depend upon the general sales force to bring them a high volume of business. It has been found that one or two weeks of intensive training are absolutely essential for salesmen and that it takes from one to three months selling experience in the field before a man actually begins to show results.

House-to-house canvassing has been found to be the most successful way to secure prospects. Canvassers or junior salesmen have been used for this purpose and the prospects uncovered have been turned over to the regular salesmen to follow up. The free trial method has been tried by a number of companies with more or less success, but it is generally admitted that this policy should be avoided wherever possible. Continuous sales effort rather than seasonal or campaign selling was found to be the best policy to pursue.

Compensation of Salesmen

It is generally recognized that a higher type of salesman than the average is necessary for the specialized job of selling electric refrigerators. To secure such men a better scale of remuneration must be offered than for the average type of salesman employed by the utilities. Methods of payment vary widely. Straight salary; salary plus commission, and straight commissions may be paid. Irrespective of the method of payment used, it should be possible for a refrigerator salesman to earn from $250 to $500 a month and even more during the more active part of the year. Where salary and commissions have been paid, the general policy seems to be to give the salesman $100 monthly plus 5 per cent of the installed price. Some dealers pay a straight 15 per cent on the factory list; others, a straight 10 per cent on the installed price. A successful method employed by one power company has been to give the salesman $175 a month and $25 additional for each machine over five sold during the month and an additional sum of $10 per machine sold for cash or $5 for a 12-months' contract.

Terms Quoted to Users

The most popular method of quoting terms to users employed in this territory is to add freight, cost of handling, installation, and carrying charge to the factory list. This price then is quoted to the customer with the statement that the reduction for cash will be 10 per cent. This is the sales plan successfully used for the majority of electric ranges sold in this territory.

Remarkable as it seems, the majority of sales made this year has been for cash, indicating that the type of prospects reached so far has been people of considerable means.

The problem of time payments is becoming more important. A variety of methods is being used. Usually a down payment of from 10 to 20 per cent of the installed price is required and the balance is spread in equal payments over a period ranging from 12 to 24 months. The most popular terms are 12 or 18 months and there is considerable tendency to keep away from the 24-month payments wherever possible. Most dealers declare that it is desirable to secure a sufficiently large enough down payment to pay the cost of installation and the salesman's commission.

The majority of machines is sold under guarantee of one year with free service for a like period. This is particularly true of central stations. Distributors and dealers, however, are displaying a tendency to cut the free service period to six months and in some instances to as low as 90 days. Defective parts will be furnished for a year but a charge will be made for labor after the expiration of the free service period. Central stations have given more liberal service than have most other dealers and they have also been criticised for this practice. Seemingly it would be desirable to develop a satisfactory service policy which would fit all classes of dealers and distributors. In this territory, where a large number of electric ranges has been sold, there is a tendency for the power company to follow the same servicing plan on refrigerators as has been employed for ranges. Under such a plan no charge is made for labor and material for the first year and at the close of that time the consumer is merely charged for material used.

Servicing Experience

In this territory the survey shows conclusively that service costs have been too high. In most instances the cost of service has been out of line with revenue. In some cases the first year's servicing approximated two-thirds of the first year's revenue. Servicing experiences range from highly satisfactory conditions to such serious conditions that power companies and dealers have given up selling of machines for the year. Difficulties have not been confined to one make of refrigerator, as types which have given considerable trouble in one locality have been perfectly satisfactory in another and vice versa.

The survey brought out the fact that there is a serious lack of data as to servicing costs. Only in one or two instances were exact figures available. It is imperative for power companies, distributors and dealers to inaugurate means of recording the cost, nature and frequency of every service call. Naturally highest servicing costs were reported by those power companies and dealers who were the least well fitted to sell and install properly. Among the distributor-dealers who had been in the business two or three years, servicing costs as low as $2.34 a month for a year were reported. Naturally as the number of machines in use in a given locality increases, the service cost per unit will decrease. The opinion was expressed by some men in the refrigerator industry that servicing costs should not exceed $5 per machine per year and that costs as low as $2.50 to $3 per machine per year could be attained.

Among the policies pursued by some companies to eliminate high service costs has been that of having the machines inspected two or three times during the first month's operation and then approximately every three months thereafter. This has served to cut down the number of service calls.

Complaints were many and varied. Among those occurring most frequently were leaks, float valves, odor, thermostat, expansion valves, belt adjustment and general regulation, poor factory inspection, temperature control and noise. Poor factory inspection and hasty or careless installation were considered to be contributing factors in the majority of service difficulties. It was stated repeatedly that 90 or 95 per cent of the troubles could be attributed directly to one or both of these causes rather than to poor design or bad mechanical construction.

A more complete training of the installation and service men; rigid inspection and testing of unts before they leave the factory, proper packing of the units for shipment and scrupulous care in making the installation will bring about a solution to the servicing problem. It was to the credit of the manufacturers that where their product gave trouble and where the difficulty was due to poor workmanship or lack of inspection they wholeheartedly accepted their responsibility.

One of the reasons for the comparatively poor showing in this territory has been the lack of proper distribution set-up. Many manufacturers entered this field late and their efforts to bring about satisfactory dealer distribution were not successful. As competition for outlets became keen, there was a tendency to tie up with dealers who had neither the organization nor the facilities to sell electric refrigeration. With the exception of the larger dealers, few knew much about the refrigeration business and none could tell where he stood as to sales and servicing costs and profits and loss.

Relations Between Manufacturers, Distributors and Dealers

There seems to be a tendency in this territory to follow the distributor-dealer or factory branch method of distribution. This method has been used most successfully in those sections where the power companies have not merchandised.

Dealers interviewed were practically unanimous in the feeling that the margin was not sufficient to enable them to put the intensive sales effort behind the business necessary to give profit-making volume and at the same time to cover the installation and servicing expenses. It was generally agreed that a minimum of 40 per cent is required and 45 per cent would be even more desirable. Distributors who had the widest experience held that a complete line of electrical refrigeration equipment, including all types of domestic and commercial machines, constituted a business in itself sufficiently large to require a specialty house to handle it.

One electrical contractor who specializes in residential wiring found that he was able to do a fair volume of refrigerator business by attempting to sell refrigeration to every home-owner whose house he wired. Another contractor-dealer was interviewed who had devoted so much time to refrigeration that the balance of his business was suffering. A third was found who intended gradually to eliminate other departments of his business as rapidly as his refrigerator sales increased.

In those cases where the central station was pusuing a fair and ethical policy in merchandising refrigerators, there was no complaint on the part of dealers. Such criticism as developed had mostly to do with unfair advantage taken by the power company in the way of offering unqualified free trial and indefinite service and in intimating that certain concessions would be made, particularly in the matter of line extensions if the prospect purchased a refrigerator from the central station.

In two cities the practice of allowing architects and contractor-builders a discount resulted in a chaotic condition which completely disrupted the price situation. One well-informed man in the larger of these two cities ventured the assertion that 90 per cent of the machines sold in that territory this year had been sold at a discount. In a few instances the salesman split commissions with the purchaser to make the sale. The architect contractor-builder discount situation could probably be corrected if representative refrigerator dealers in these cities would get together and agree to abolish discounts entirely or else agree to a rigid scale of discounts to apply on quantity purchases.

A few of the most successful dealers no longer are worried over the problem of selling and servicing, but are vitally concerned over the question of profit. In short, their problem is to find out where they stand and to cut sales and service costs to a minimum so that a profit may be earned.

Sales Resistance

As indicated in the national survey the question of price and the feeling on the part of the general public that machines will be cheaper and better next year, have constituted the major sales resistances in this territory.

In northern California and in the Pacific Northwest, particularly in those cities on or near the sea, the mild summer temperatures have proved a considerable factor in keeping sales below expectations. The public in these localities has not been sold on the refrigeration idea as indicated by the consumption of ice. In this respect it is interesting to recall the results of two surveys in this territory in which it was found that less than 35 per cent of the residents in these two communities used ice any part of the year and only 12 per cent used ice during the winter months. Thus it would seem in these districts that before any volume of domestic electric refrigeration can be sold, a very material sales resistance must be broken down through education, advertising and other promotional methods. The public must be taught the value of and the need for refrigeration in the home irrespective of climatic conditions.

In rural sections where it might be expected there would be a considerable market for electrical refrigeration, particularly since the majority of the farms have electric service, it was found that sales resistance was sometimes high. The statement was frequently made that "farmers do not need refrigeration." On the smaller farms, such as are found in certain sections of Oregon, Washington and California, where milk is used as produced, where poultry is killed as needed and vegetables kept fresh in the ground, it was found very difficult to persuade the farmer that he needs refrigeration, particularly at an outlay of $300 or more. In the rural districts where farms were larger and more prosperous, particularly in central and southern California, distributors found a ready market.

While men in the industry generally state that the so-called remote unit is the most desirable, it was found that the sales resistance on this type was considerably higher, due to the additional expense of installing the unit in the basement. It was found that a self-contained unit was easier to sell, particularly to people who rent their homes. It was also found that by far the greater proportion of ice boxes in use in the homes was not sufficiently efficient to allow for the installation of a remote unit. In many cases it was necessary to sell a new ice-box along with the unit.

In certain sections of the Western states where summer temperatures reach a point as high as 115 deg. F., it was found that the average compressor unit did not have sufficient capacity to keep the temperature of the box below the refrigeration point. Dealers stated that it seemed likely that manufacturers would have to develop a special unit for districts of this character.

Market Possibilities

Despite the trials and tribulations of 1926, dealers and distributors are exceptionally optimistic regarding the prospects for next year. Invariably sales quotas double or treble those of the current year were reported. The majority was confident that the experience gained during the current year would enable them to dispose of those quotas. Conceivably certain sections of this territory constitute some of the finest markets for electrical refrigeration in the country. Central and southern California, Arizona, New Mexico, Utah and Colorado are states where refrigeration is absolutely essential, particularly during the summer months. In California alone it is estimated there are 800,000 domestic consumers residing in localities where some type of refrigeration should be in the home. The remaining 400,000 domestic consumers in California reside in localities where considerable educational work will have to be done before there will be any prospect for large volume of business. The same holds true of the western portions of Oregon and Washington. The eastern portions of these states, as well as Idaho and Montana offer fair prospects.

Opinions as to the possible number of prospects among the utilities' customers varied from 10 to 30 per cent of the total number of domestic consumers.

On the basis of 1927 quotas, as reported by the central stations, dealers and distributors interviewed, it seems likely that there will be 40,000 domestic units sold in the eleven Western states during the coming year. The number of commercial units sold will, in all probability, exceed 5,000. The best estimate of the sales possibilities was offered by a central station executive who estimated that at the end of a 3-year period 10 per cent of his domestic consumers would be refrigerator users; one per cent of his customers had been sold during 1926. He believed that 3 per cent would be users at the end of 1927; 6 per cent at the end of 1928; 10 per cent at the end of 1929. He based this prediction upon the premise that the machines would continue to be of a high standard and that there would be price reductions corresponding to the increased volume of sales which the industry anticipates.

Conclusions Drawn from Survey

By summarizing conditions and trends as brought out in the survey and considering the opinions expressed by the men interviewed it is possible to set down a number of conclusions from which the industry should be able to profit.

1. From the standpoint of the manufacturer, there seems to have been a race of supremacy during the year on the part of several of the largest producers that has not helped the general situation.

High pressure production and lack of proper factory inspection have resulted in a product which caused dealer and consumer dissatisfaction, and have contributed to high service costs. Manufacturers had a tendency to lay down sales programs inconsistent with the ability of their factories to produce units. There was a feeling in consequence that their product suffered. Simplification of mechanical design and standardization as to models are two problems which the manufacturer must face. If next year is to come up to present expectations, the trade expects the manufacturer to turn out a product that is mechanically correct and properly inspected.

2. Dealers and distributors can well afford to study their sales and service problems. Accurate data on the cost of doing business so that dealers can learn where they staid with reference to profits and losses are highly essential. Dealers must recognize that handling electric refrigeration is a new and highly specialized business and one which requires considerable capital. Even with a 40 per cent margin the most agressive sales tactics will have to be pursued and every advantage taken of the manufacturers' sales and service helps.

3. For those central stations not definitely committed to a merchandising program a policy of complete co-operation with existing refrigerator outlets should be pursued. This co-operation rightly can take the form of talking, preaching and recommending electric refrigeration to consumers. It should include advertising and the practice of allowing distributors and dealers courtesy displays in district offices and show rooms. It might even be possible to arrange with distributors to pay a commission on prospects turned in by employees.

4. Based upon the experience of those central stations that actively sold refrigeration during the year and upon criticisms advanced by dealers and distributors, a sound refrigeration merchandising policy for the central station to pursue would seem to be as follows:

A. The central station must recognize at the outset that the most rapid and effective way to build refrigeration load is to foster and encourage all possible agencies and outlets in the sale of this appliance. To this end the utility should conduct its refrigeration business on a legitimate profit-making basis, and its sales and servicing policies should be such that the dealer will have an opportunity to compete on an equal basis.

B. In selling this appliance new sales methods and salesmen of a type higher than the average are required. Best results can probably be achieved where a special refrigeration department is organized in the sales department. Men qualified to sell refrigeration cannot be secured for the scale of remuneration paid ordinary appliance salesmen. Irrespective of the method of payment used it was the consensus of opinion that salesmen should be allowed to earn from $250 to $500 per month. Salesmen should not be allowed to take unfair advantage of the central station's favorable position with its customers to the extent of holding out special inducements that the dealer cannot offer. Salesmen, either for dealers or central station, require special training for a period of one or two weeks, preferably in a manufacturer's school.

C. The central station's servicing policy should conform to that of the dealers and distributors in its territory. Indefinite free service as an inducement to purchase works a hardship on the dealers and also burdens the central station with an unnecessary and unjustifiable expense. Service men should receive thorough training, either for two or three weeks and should then be sent out with trained service men for one to three months.

D. All of the ordinary methods of securing prospects can be used. Here in the West where considerable progress has been made in the sale of electric ranges, central stations find that range customers are preferred prospects as they are already accustomed to high monthly kilowatt-hour consumption and to a relatively high capital investment in electrical appliances.

E. Unqualified free trial seems both unnecessary and inadvisable. It works a hardship on dealers and constitutes weak selling.

F. Commercial refrigeration presents a highly specialized field. Because of its complexity refrigeration sales engineers are necessary. Where the central station cannot secure such a man satisfactory results have been obtained by having power salesmen co-operate to the fullest extent with the commercial refrigeration salesmen of the distributor-dealers.

G. If machines are set up and thoroughly tested before delivery to a customer and delivered cold less servicing is required.

H. It is wise to inform thoroughly a customer concerning the operation of a machine at the time of its installation. It is also good policy to have the machine inspected two or three times during the first month and then quarterly or semi-annually thereafter.

I. Because there has been an almost universal laxity in keeping figures on the cost of selling, the recommendation was frequently made that data on handling, warehousing, advertising, servicing and other elements entering into the sale's cost be carefully kept.

5. The year 1926 has seen electric refrigeration pass through many of the difficulties of any new business, particularly with reference to production and selling. The problem in the West has been one of sales and servicing. The former is a job for the central station, distributors and dealers. The latter has been partly due to the manufacturers and partly due to improper installation. The situation is not altogether discouraging and the solution is already in sight for many of the problems discussed. At any rate, the experience gained during the months just passed promises to bear fruit in 1927 in direct proportion to the extent to which the industry profits by the lessons learned.

Electricity Co-operates with Oil

By Roy Willmarth Kelly

Manager, Industrial Relations, Associated Oil Company

AS crude oil has become more valuable, and as markets have been developed for gas produced in oil fields, it is no longer economical to operate boiler plants and maintain steam lines for oil field power. The electric motor has proved its case by gains in convenience and safety, as well as by decided savings in cost of operation. These considerations as well as the co-operative attitude of the oil industry towards the electrical industry are told in this article by an oil man.

DURING the past five years, much attention has been given by leading Western oil companies to cutting costs in oil production. One of the largest California companies reports a gain of nearly 300 per cent in the amount of oil produced per man during 1925 in comparison with the year 1921. This company increased its crude oil production from 792,522 barrels in January, 1921, to 1,431,228 barrels in December, 1925. During the same period, the field working force was decreased from 1,914 to 1,418 men. This means an increase from 414 barrels per man on the payroll to a production of over 1,009 barrels for each man employed.

Part of this increase can be ascribed to the fact that the newer fields in California produce many more barrels of oil per well than was true of the fields which were yielding the major part of the state's crude oil production in 1921. Nevertheless, this company states that it has the statistics available to prove that, even in the older well-established fields, both the cost of production and the number of hours of labor required to produce a barrel of oil have been greatly reduced.

Very striking reductions were effected in the number of men needed to operate the older fields by studying the question of transportation for employees who are known as "oilers" or "pumpers." These men go about from well to well and from jack-plant to jack-plant, watching the oil lines and the machinery, making any minor repairs that may be necessary, and caring for the oil as it is pumped. For many years, it was customary in the oil fields for these men to walk about from place to place. Where the wells were located some distance apart, a pumper could manage only a few wells. An experiment was tried in a few fields by providing these men with small light cars. It was found that sufficient saving could be effected to return the purchase price of the car in six months' time. The working force in this particular occupation was cut down from three-fourths to one-half, depending upon the character of the country and the roads over which the men traveled.

Even greater cost reductions have been made by applying electricity as a source of power for pumping. A survey recently made in four oil fields in Kern County, Calif., shows the total connected electric load to be approximately 12,000 hp. Of this load, 10,350 hp. is in pumping motors, 750 hp. in drill motors, 750 hp. in line pumps, and 1,050 hp. in machine shops, garages and ice plants, operated by the various oil companies. The average monthly consumption of these motors approximates 2,000,000 kw-hr.

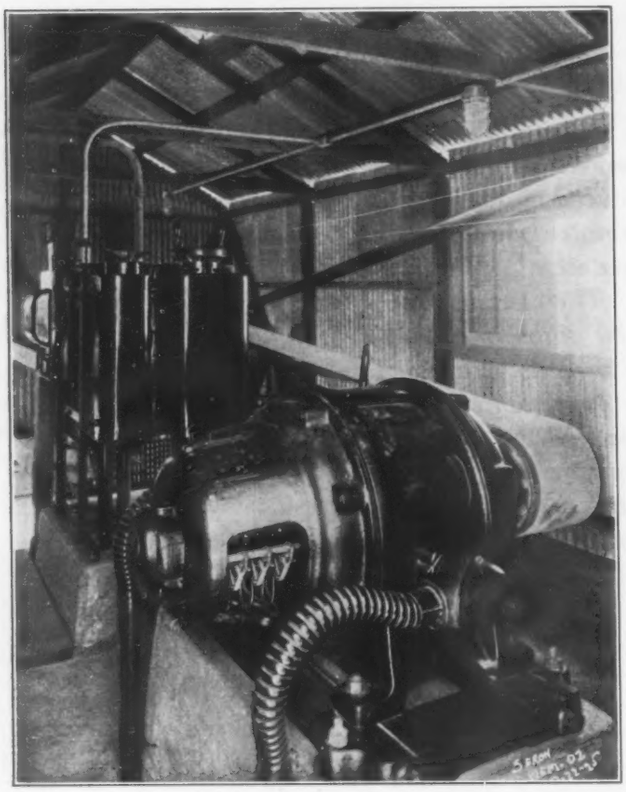
This marked turn toward electric power in oil field operation is in strong contrast to what was seen in the oil fields ten years ago, when steam was everywhere the common source of power. As crude oil became more valuable, and as markets were discovered for the gas produced in these fields, by pipe lines connected with Los Angeles and other cities, it was no longer economical to operate boiler plants and maintain steam lines. The motor has proved its case by gains in convenience and safety, as well as by showing decided savings in cost of operation over other methods for pumping wells. Reports on 203 wells recently gathered from various companies show an average cost of 4¼ cents per barrel for electric power. The cost per well per day averaged $1.42, with an average consumption of 3.3 kw-hr. per barrel of oil produced. The 203 wells in question were averaging 204,150 barrels per month.

In addition to individual motors operating the pump at a single well, motors are being extensively used for operating jack plants which are connected to a considerable number of wells. Data collected from various companies show that jack plants can be operated with a cost as low as 35 cents per well per day for electric power. The cost for operating the same type of jack plants on gas engines runs from $1.25 per day up. Steam costs may be as high as $6 per day per well.

Reports from companies keeping records of steam in comparison with electricity over a period of years show especially marked savings where bad water conditions prevail. At McKittrick, in Kern County, records kept over a period of years show that where steam is used for pumping, the cost per well for all the items connected with maintenance and operation of boiler plants, steam lines and steam engines, varies from $5 to over $7 per day. Similar costs for wells pumped with gas engines vary from $2 to $2.50 per day. It has been clearly demonstrated that motor-driven equipment can be operated

at a cost considerably lower than $2 per well per day.

In southern California, the oil fields are rapidly becoming netted with power lines. It is only a matter of time until nearly all the oil pumping in the well-established fields will be done by electricity. Companies interested in this development report that much of the saving incidental to electric power is brought about by being able to keep the wells pumping constantly. Repairs are fewer, accidents are infrequent, and less labor is required to supervise the wells.



Interior of motor house, McKittrick, Calif. Floors and piers for the motors are of concrete. Guards were removed while this picture was taken.

In the Sunset-Midway fields in California, considerable quantities of gas are being utilized by the hydroelectric power companies to increase the voltage of their power lines which pass through this district.

There has been at times a certain amount of hesitation on the part of oil operators to advocate the use of electricity, due largely to the fear that electricity might eventually have a bad effect upon the fuel oil market by supplanting oil as a source of power. This fear is almost groundless, as experience has shown that oil and electricity each has its own field of service. Each supplements the other, and, under right conditions, hydroelectric power and oil production make progress side by side.

In 1924 the electric utilities of California used over 10,000,000 barrels of oil, owing to dry year conditions as against 3,000,000 barrels in 1923, a year of normal rainfall. This use of 7,000,000 barrels in excess of customary requirements should remind everyone that all our public utilities are closely dependent upon the petroleum industry. Lubricants and fuel for power purposes, as well as for extensive fleets of motor-driven vehicles are, under present conditions, essential to the continued operation of our telephone lines, our hydroelectric power companies, our transportation systems, and the plants supplying us with water, gas and light. Although there is no definite understanding or arrangement covering the situation, it is taken for granted that the petroleum industry holds itself ready at all times to meet the emergency requirements of the public utilities, even to the extent that other users are requested to restrict their customary use of oil. No one knows when circumstances even more urgent than a dry year may arise. Fire, storms, landslides, any one of many causes may appear, to increase the dependence of electric power plants upon oil much beyond their usual daily consumption.

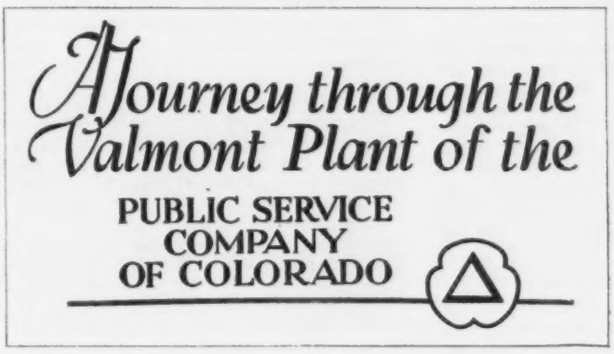
A complete rig and motor house at McKittrick, Calif., showing the method used to balance rods and fluid. The motor drives the pump by means of the rod projecting from the motor house to be seen at center of the photograph.

The interdependence of these two great basic industries is perhaps not generally clear. These problems ought to provide food for thought on the part of everyone who studies the current recommendations being proposed by legislators and others for regulating our public utilities, as well as our petroleum resources.

Colorado Utility Encourages Visitors to Plant by Special Effort

NOT only is the Public Service Company of Colorado willing for the public to view its new steam generating plant at Valmont, but it is actually spending money and energy to interest people of the state in making the trip there and viewing the source of their electrical energy at first hand.

The department of public relations, under the guidance of Rufus G. Gentry, and assisted by the engineering and the publicity departments, is carrying out a program through which it is hoped eventully to acquaint a fair share of the population of Colorado with the technical features of the $6,000,000 plant.



An attractive booklet bearing this inscription serves as a guide and a souvenir to those who visit the Valmont plant of the Public Service Company of Colorado.

As fast as is practicable, various groups in Denver, Boulder and other nearby cities are being conducted through the plant by company guides who explain the essential features and answer all questions advanced.

Within the last few months over 2,000 persons have been piloted through the station in these groups. The Rotary, Lions, Optimist, and Advertising clubs of Denver, members of the Allied Building Trades Council of that city, officials from various municipal departments and several other industrial and civic bodies are included in the list of visitors to date.

To make it more feasible for such groups to view the plant, there have been fitted out a kitchen and dining room on one of the upper floors of the boiler room. The facilities are thus at hand for dinner and luncheon meetings, making it possible for organizations to combine their regular gatherings with their inspection of the station.

All kitchen equipment is electrically operated, making an additional feature of interest in connection with the visit. The assembly room can accommodate 250 persons and cafeteria style chairs make it possible to feed that number at one time.

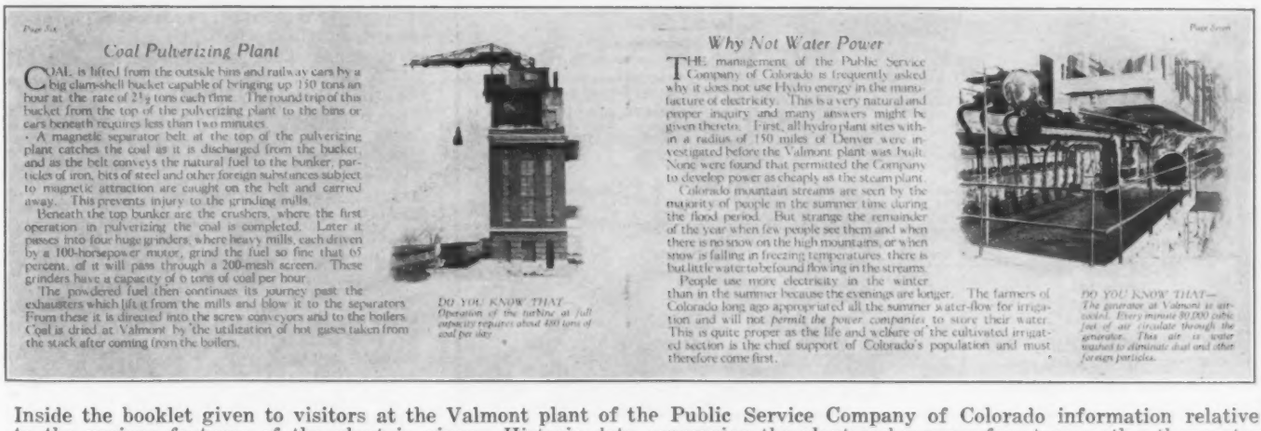
To facilitate the tour of inspection, arrows and signs have been installed throughout the plant. Visitors are taken first to the fifth floor of the plant in an automatic elevator. Stepping out of the lift, they find arrows directing their progress throughout the building. Every piece of equipment bears a sign explaining in language intelligible to the average layman just what its function is and what its relation is to the plant as a whole.

Thus, while guides are furnished for all parties of any size, it is possible for the casual visitor to make his way through the plant alone, viewing its various parts in the most desirable order and becoming educated as he goes.

As a further aid, an attractive 16-page booklet has been prepared by E. K. Hartzell of the Boulder publicity and advertising department entitled, "A journey through the Valmont plant of the Public Service Company of Colorado."

This is in essence a guide book. It is replete with interesting facts and pictures in connection with the plant. The description is given in the same order of sequence as visitors are conducted through the station. In addition, it gives general information concerning the dissemination of the electrical energy generated there and is calculated to comprise a composite picture of the producing and distributing departments of the company.

The booklet is attractive in make-up and of high class workmanship throughout. It thus is enough of a literary effort and compendium of information to make it desirable as a souvenir. Copies of the booklet are available free of charge at various offices all over the system and they have been the means of inducing many to visit the plant.


Coal Pulverizing Plant
COAL is lifted from the outside bins and railway cars by a big clam-shell bucket capable of bringing up 150 tons an hour at the rate of 2½ tons each time. The round trip of this bucket from the top of the pulverizing plant to the bins or cars beneath requires less than two minutes.
A magnetic separator belt at the top of the pulverizing plant catches the coal as it is discharged from the bucket, and as the belt conveys the natural fuel to the bunker, particles of iron, bits of steel and other foreign substances subject to magnetic attraction are caught on the belt and carried away. This prevents injury to the grinding mills.
Beneath the top bunker are the crushers, where the first operation in pulverizing the coal is completed. Later it passes into four huge grinders, where heavy mills, each driven by a 100-horsepower motor, grind the fuel so fine that 65 percent. of it will pass through a 200-mesh screen. These grinders have a capacity of 6 tons of coal per hour.
The powdered fuel then continues its journey past the exhausters which lift it from the mills and blow it to the separators. From these it is directed into the screw conveyors and to the boilers. Coal is dried at Valmont by the utilization of hot gases taken from the stack after coming from the boilers.
DO YOU KNOW THAT—
Operation of the turbine at full capacity requires about 400 tons of coal per day.
Why Not Water Power
THE management of the Public Service Company of Colorado is frequently asked why it does not use Hydro energy in the manufacture of electricity. This is a very natural and proper inquiry and many answers might be given thereto. First, all hydro plant sites within a radius of 150 miles of Denver were investigated before the Valmont plant was built. None were found that permitted the Company to develop power as cheaply as the steam plant.
Colorado mountain streams are seen by the majority of people in the summer time during the flood period. But strange the remainder of the year when few people see them and when there is no snow on the high mountains, or when snow is falling in freezing temperatures, there is but little water to be found flowing in the streams.
People use more electricity in the winter than in the summer because the evenings are longer. The farmers of Colorado long ago appropriated all the summer water-flow for irrigation and will not permit the power companies to store their water. This is quite proper as the life and welfare of the cultivated irrigated section is the chief support of Colorado's population and must therefore come first.
DO YOU KNOW THAT—
The generator at Valmont is air-cooled. Every minute 80,000 cubic feet of air circulate through the generator. This air is water washed to eliminate dust and other foreign particles.

Inside the booklet given to visitors at the Valmont plant of the Public Service Company of Colorado information relative to the various features of the plant is given. Historic data concerning the plant and reasons for steam rather than water power are included among details of the machinery and its uses.

CENTRAL STATION CONSTRUCTION OPERATION AND MAINTENANCE

Speeding Operations on Big Transmission System

Localization of Routine Dispatching Relieves Central Office and Facilitates Service Continuity

By H. W. NEIR, Dispatching Supervisor, Southern California Edison Company, Los Angeles

System expansion and load growth on the system of the Southern California Edison Company threw too great and diverse burdens upon the one central dispatching office and its crew of 8 men. Accordingly in the fall of 1923 the work formerly concentrated in the main office was divided and assigned to two additional sub-dispatching offices. Further to relieve the increasing routine of the dispatching organization 12 strategically located substations were picked out and designated as "switching centers." Each of these controlling points was selected after careful consideration of its position in the transmission and distribution system and of its telephone connections and facilities. Their positions on the system are shown in Fig. 1.

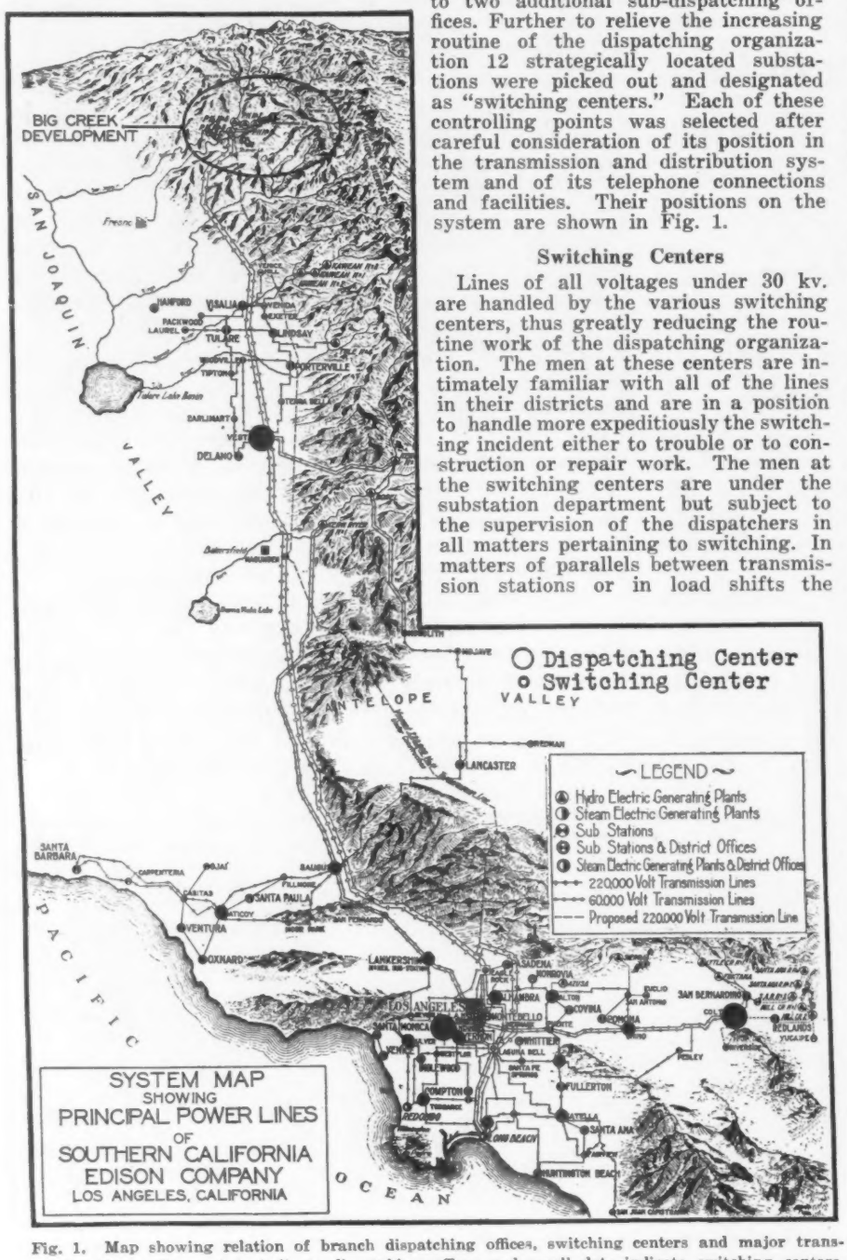


Fig. 1. Map showing relation of branch dispatching offices, switching centers and major transmission lines. Large dots indicate dispatching offices and small dots indicate switching centers.

Switching Centers

Lines of all voltages under 30 kv. are handled by the various switching centers, thus greatly reducing the routine work of the dispatching organization. The men at these centers are intimately familiar with all of the lines in their districts and are in a position to handle more expeditiously the switching incident either to trouble or to construction or repair work. The men at the switching centers are under the substation department but subject to the supervision of the dispatchers in all matters pertaining to switching. In matters of parallels between transmission stations or in load shifts the operators at the switching centers work directly in conjunction with and under the direction of the dispatching office covering the particular territory in question.

The decentralization of authority has resulted in an average reduction in time of interruption of at least 50 per cent, as far as the distribution system is concerned. Further it has resulted in betterment of the operating personnel and in better handling of load and transmission problems by the dispatchers.

Sub-Dispatching Offices

The division of the direct dispatching responsibility among three offices required the development of that organization as shown in Fig. 2. Under the present scheme there are 10 men at the central office and 4 each at Vestal and at Colton, the sub-offices. The divisional dispatching offices handle all of the load and transmission problems of their districts and work in conjunction with the central office in major system operations. Here again the decentralization of authority has resulted in greatly speeding up operation in connection with system troubles, normal routine and in construction or repair work and also reacted favorably in personnel quality.

Aside from their activities in handling the system, these divisional dispatching offices take the reports of and direct the work of patrolmen in emergency work and gather the reports and operating data on the various plants and stations under their jurisdiction, forwarding composite reports to the central office for the system reports kept up there.

The sub-dispatching offices at Vestal and at Colton are installed in buildings separate from the substation buildings themselves. These buildings contain the office, telephone terminal and test room and all necessary equipment. The office in each case is about 20x20 ft. and contains the desk with its telephone switchboard, system diagram board, necessary indicating instruments and usual office equipment. In addition, there is installed an annunciator board, shown in Fig. 4 at the right of the telephone board on the operator's dask. This annunciator gives the dispatcher instant indication of the operation of any circuit breaker at that particular station. Thus he is enabled at once to proceed with whatever system operations may be necessary without taking the time to call the station operator to find out what happened. In addition, this feature leaves the operator at these important stations free to proceed with the clearing of his trouble without taking the time necessary to call the dispatcher. See Fig. 3.

The dispatcher's desks at the sub-offices are wired for 20 telephone circuits and are fitted with double-throw keys instead of cords and plugs for

putting up connections on special buses. This latter feature acts to speed up operation.

After a study of the company's telephone system numerous changes were

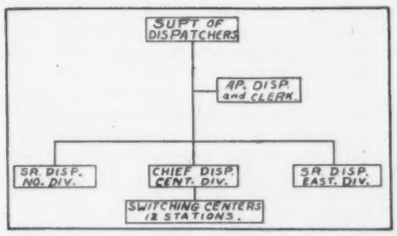


Fig. 2. Diagram of dispatching organization.

made to fit the requirements of the new dispatching system. Inter-district communication was necessary as well as ties with the other dispatching offices and with the switching centers.

Fig. 3. New sub-dispatching office at Vestal substation in the San Joaquin Valley; substation in the background.

The flexibility of the communication system was increased greatly and the traffic of the general office trunk lines materially reduced, again resulting in more expeditious operation.

In addition to the above-mentioned changes in the dispatching organization, a man was chosen from the hydro-generation department and stationed at Big Creek No. 3 to act as water dispatcher. His duties are to regulate the withdrawal of water from the various reservoirs, and the load on the various plants and the various

Fig. 4. Standard telephone desk used at sub-dispatching offices.

units within the plants in such a way as to increase the over-all efficiency of the system.

Beneficial Results

Summed up, the changes effected have resulted in several advantages:

1. Reduced the length of system outage on major troubles approximately 40 per cent.
2. Improved the over-all efficiency of both the hydro and the steam plants.
3. Materially reduced the time of routine switching of lines and apparatus.
4. Reduced the length of interruptions on district feeders approximately 50 per cent.
5. Allowed more time for the dispatchers to devote to more important load and dispatching troubles.
6. Enabled operators at switching centers better to familiarize themselves with the system by a closer contact with actual operating problems.

Operating Data Is Obtained on Butterfly Valves

Forces to Be Overcome in Closing a Butterfly Valve Under Free Discharge Determined by Experiments

By C. B. McAULAY, Chief Engineer, Joshua Hendy Iron Works, Sunnyvale, Calif.

Popularity of the butterfly type of valve for hydroelectric installations has increased rapidly in the last few years. With this increase there is a natural demand for better construction, less leakage past the seats and sturdier operating mechanisms. In recent installations the safety of the power house has been intrusted wholly to the ability of this type of valve to close in case of rupture to the penstock. In at least one case on record the butterfly valve justified this faith.

Some engineers specify that the valve be constructed so that it can be closed with free discharge under full reservoir head. This is a condition that in all probability never will be met with, the nearest approach within the author's knowledge being the jamming of the turbine wickets in the wide-open position necessitating the closure of the butterfly valve to shut down the unit. With the latter condition or with a rupture in the penstock there will be considerable back pressure until the valve is about half closed, from which position to full closure spouting will occur through the valve.

A divergence of opinion exists between manufacturers as to the forces to be overcome in closing a butterfly valve with free discharge. The Joshua Hendy Iron Works has just completed a series of tests to supplement the theoretical assumptions. Unfortunately these had to be made with a small valve, 3⅞ in. in diameter, and with moderate water pressures.

Water was taken from an elevated tank through a centrifugal pump. Maximum static pressure developed by the latter was 105 lb. per sq.in. which dropped to about 19 lb. per sq.in. with the butterfly valve fully opened. The valve was attached at the end of a 3½-in. pipe and discharged into atmosphere. A sheave of 14-in. pitch diameter was mounted on the valve spindle and buckets were suspended to a wire attached to the sheave. Thus the valve could be opened, held balanced or closed by changing the weights of the buckets, sand being used as a weight medium. The rim of the sheave was graduated and a pointer was mounted on the valve body to indicate valve openings in degrees. The valve spindle was well oiled before starting the experiment.

To ascertain the torque when not under pressure, the valve first was closed tight under static pressure and then this pressure relieved. It required 58 lb. at 1 in. to start the disc from its seat and 9 lb. at 1 in. to continue the movement. With the glands unpacked it required 1¾ lb. at 1 in. to move the disc.

The result of the first experiment is shown in Fig. 1. The valve shutter was a plain disc with a circular boss to receive the spindle. When closed the disc was in a plane at 40 deg. with the vertical. With the valve tightly closed and under pressure, sand was poured into the bucket on the opening side until the peak load was reached at about 50 deg. from the vertical. At any point between 50 deg. open and full closure it required an effort to move the disc in either direction, while from 50 deg. open to full open the disc would swing back to the 50-deg. point.

The second experiment is shown by Fig. 2. The disc was turned down until it seated at an angle of 5 deg. and the experiment was conducted as shown in Fig. 1.

The third experiment, shown in Fig. 3, was made with pressure applied to the opposite side of the disc to that in the first two experiments.

In the fourth experiment, Fig. 4, an attempt was made to hold the water

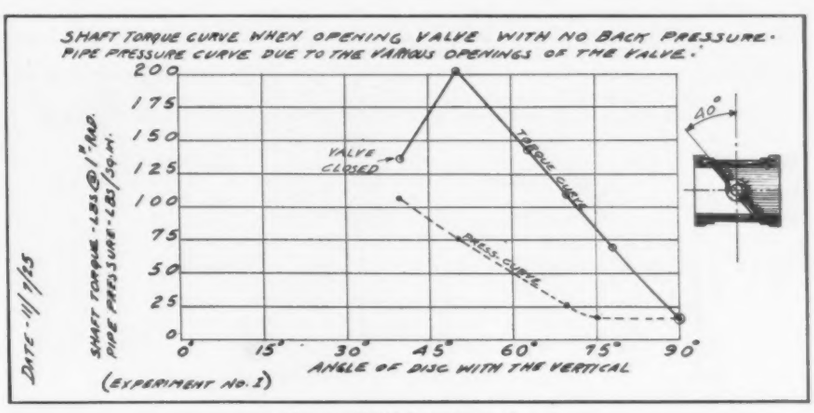


Fig. 1. Butterfly-valve tests.

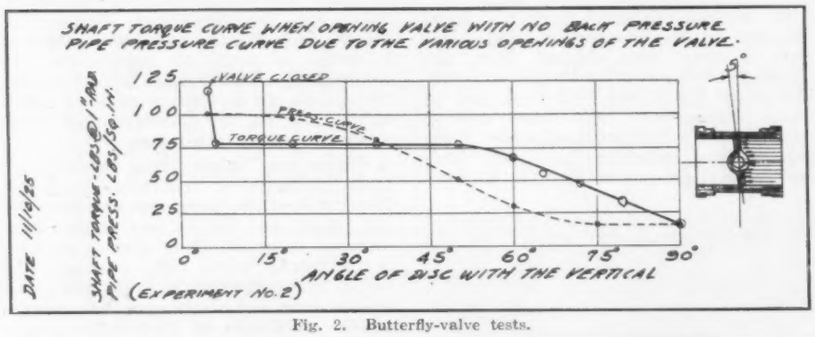


Fig. 2. Butterfly-valve tests.

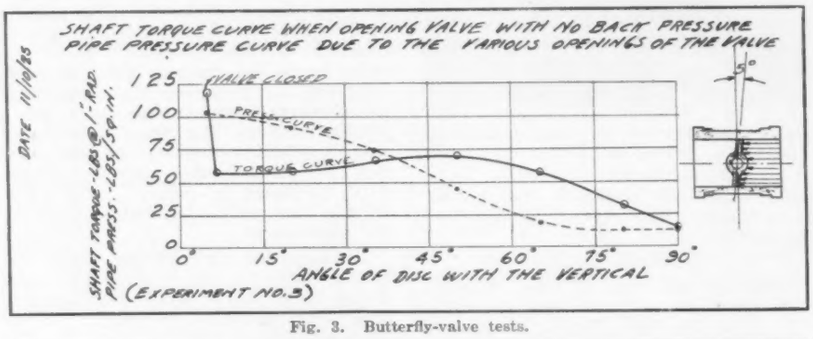


Fig. 3. Butterfly-valve tests.

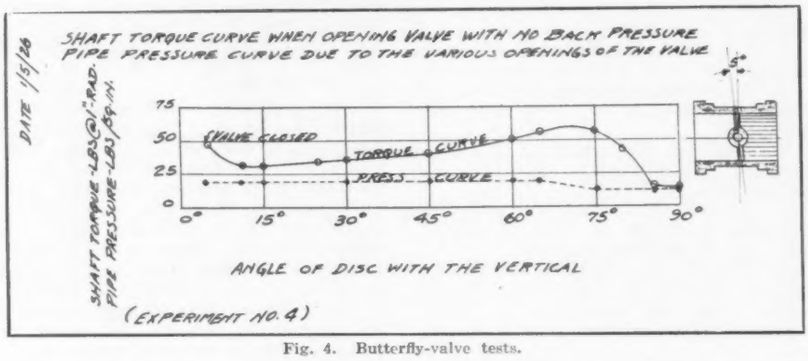


Fig. 4. Butterfly-valve tests.

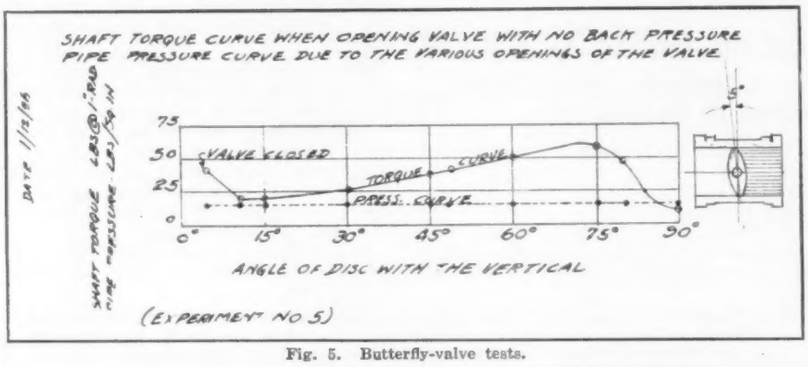


Fig. 5. Butterfly-valve tests.

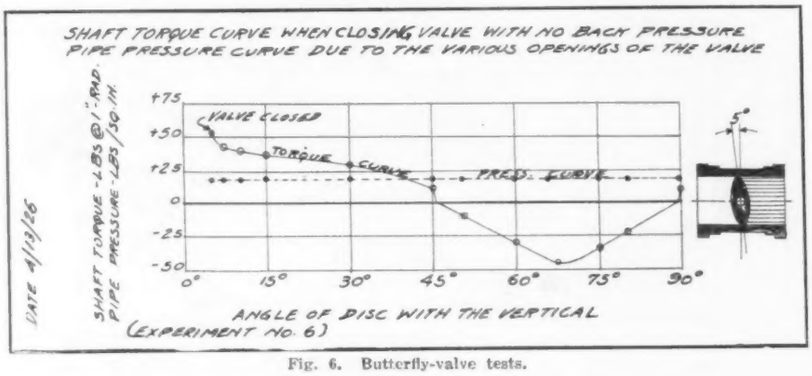


Fig. 6. Butterfly-valve tests.

pressure constant. However a slight drop-off occurred at maximum torque.

In the fifth experiment, Fig. 5, a disc with double-convex faces was used and the water pressure was kept constant throughout the stroke. It is interesting to note that the point of maximum torque was at the 75-deg. opening and not at clousure and under static head.

All the preceding tests were made by starting with the valve closed tight. The sudden drop of the torque curve at the beginning was due in a great measure to jamming the disc on its seat to shut off all leakage.

The sixth experiment, Fig. 6, was made by starting with a wide-open valve and measuring the torque through the closing stroke. In the wide-open position the disc was in balance and a slight force was necessary to start the closure. However, when the disc was moved off the center position it had a tendency to close, this tendency existing in a varying degree up to the 45-deg. position. The negative forces given by the curve are those necessary just to hold the disc at any given point.

From a 45-deg. opening to full closure the friction on the spindle would hold the disc in any position. Hence the remainder of the curve was made by setting the disc at various degrees of opening and adding weight until it started to move.

From the curve, Fig. 6, it may be seen that for closure the maximum external force throughout the stroke was that necessary to jam the valve tight enough on its seat to stop leakage. This latter force would not be so great with a proper seal ring adjusted to prevent leakage, nor would the force necessary to start the disc from its seat be so great.

The calculated force for the latter case would be in in.-lb.

P=Total normal pressure on disc, in lb.

$$T = Pc + Pur + \frac{p\ u\ d^2}{2}$$

$$C = \frac{(R^2 \cos\phi) \times 12}{4h}$$ = Point of application of force P, below the center line of the shaft in inches. (See Hughes and Safford on hydraulics, p. 45.)

R=Radius of valve in ft.

ϕ=Angle of disc from the vertical.

h=Head in ft. on center-line of valve.

u=Coefficient of friction.

r=Radius of shaft in inches at journals.

p=Pressure in lb. per sq.in.

d=2 r.

Putting R=0.1615 ft.
ϕ=5°.
Cosϕ=0.9962.
h=39.3.
u=0.2.
r=0.4062.
p=17 lb.
d=0.8125.

Then C is so small in this case it way be ignored.

$$T = 200 \times 0.2 \times 0.4062 + \frac{17 \times 0.2 \times 0.8125^2}{2} = -17..34 \text{ lb.}$$

This checks very closely with Fig. 5 after the disc is started from its seat.

If these meager tests give an indication of the true forces it is safe to say that few operating mechanisms as built are strong enough to close this type of valve under free-discharge conditions. It would seem to the author that the purchaser would have to de-

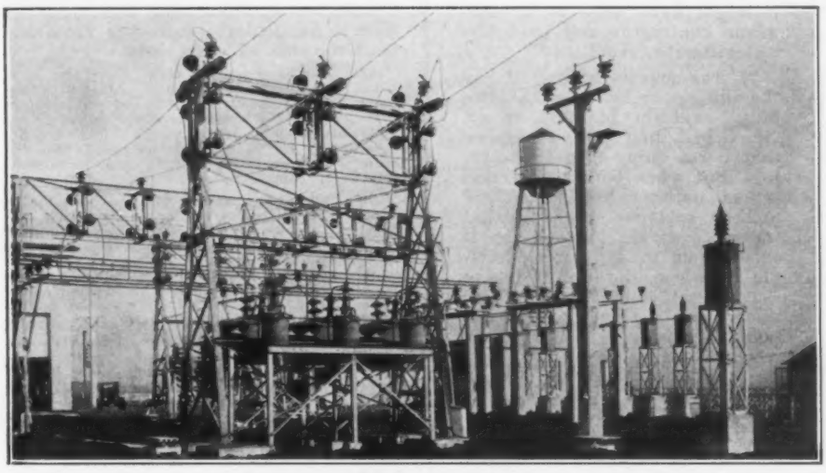
termine how far he would care to go to provide for this possible emergency.

The maximum acceptable leakage and the type of seal ring selected also would affect the design of the operating mechanism. Without a seal ring the valve may be jammed hard on its seat and still pass a large quantity of water, while with a properly designed and adjusted seal ring the butterfly valve is practically water-tight without jamming.

Combination Switching-Transformer Unit Saves Space

A standard 66-kv. combination switching and metering tower used at many substations of the Pacific Gas and Electric Company is shown in the accompanying illustration. The bus structure may be seen in the background with the transmission line leads coming from each bus through disconnecting switches to the tower. The line oil circuit breaker is mounted on an independent frame within the span of the tower footings. Attached to this same frame are the current transformers used to supply energy to instruments and relays. It may be noted that by closing the air-break switch at the top of the tower and opening the two sets of disconnecting switches the oil breaker is completely isolated and may be worked upon without any interruption to service over the line. While this is being done the bus-tie breaker serves as the automatic breaker for the line.

The single potential transformer is connected to the line-side of all switches so that meters and pilot lights will give an accurate indication of the condition of the line regardless of the position of any of the switches controlling the line at the station in question. The rotary switch at the top of the concrete pole serves to isolate the potential transformer when it is necessary to do so. Normally the fabricated steel support for the potential transformer is built higher in order to give the proper ground clearance with a concrete foundation of the same height as the other foundations of the unit set-up.



A standard 66-kv. line switch and instrument transformer unit used extensively by the Pacific Gas and Electric Company

Scale Removed from Cooling Coils by Heat Treatment

By LLEWLLYN EVANS, Superintendent of Electric Works, City of Tacoma, Wash.

Dislodging scale from cooling coils of transformers and removing same from the coils by means of compressed air has been found economical and effective by the city of Tacoma. The coils were heated to a red heat in annealing oven causing the scale to peel from the pipe leaving the pipe entirely clear and without pits. The only precaution necessary was that the temperature and time of treatment be so regulated that the coils not be deformed by the heat or due to softness of the pipe metal.

Cooling coils in service for 14 years in transformers in the city of Tacoma were found to be badly clogged with scale deposit. A total of 24 of these 2,000-kw. units was affected so seriously that it was necessary to devise a means of cleaning them satisfactorily or to replace them with new ones. The above method was hit upon partly at the suggestion of the Tacoma Welding Works and proved efficacious and satisfactory.

To remove the lossened scale from the coils an air hose was attached to one end of the coils and compressed ir passed through the coil at a high velocity, carrying the scale out with it. The accompanying illustration shows this stage of the process and shows also the mechanics beating the pipe coil to assist in the removal of scale and dust. To check the thoroughness of the results obtained by this method a section was sawed from one of the coils at a location picked at random to determine just what the results had been. The section cut out proved to be entirely free from scale and not damaged in any way by pitting.

Blowing scale dust from cooling coils after having lossened same by heat treatment.

Record Form Provides Promotion Data for Employees

Aiming to make possible the intelligent promotion of deserving and specially trained employees to more responsible and better paid positions when such positions occur in the organization, the Los Angeles Gas and Electric Corporation is collecting personnel data covering the complete histoy of all employees. These records will be compiled into usable, systematic form readily available when promotions or transfers are being considered. The form is made up of three major subdivisions, the personal data, educational history, and occupational history with the Los Angeles Gas and Electric Corporation.

Los Angeles Gas and Electric Corporation
PERSONNEL RECORD—CONFIDENTIAL

Name ... Address ... Tel. No. ...
Department ... Immediate Superior ...
Present Position ...
Duties ...

PERSONAL DATA

Single	Nationality	Birthplace	Health	Height Ft. ... In.	Weight ... Lbs.
Married	Color	Birth Date	Race	Dependent Children	Children Last Examined
Male	Eyes Glasses Worn?	Age	Facing or Home	Ages of Children	Children Vaccinated Last Examined
Female	Hearing Glasses Worn?	Live With Parents	Own Home	Dependent Adults	Last Vaccinated

EDUCATION AND SPECIAL ABILITIES

Schooling	Dip. Yes	Graduate No	Graduate Yes	Age Left	SPECIALIZATION
Grammar					
High School					
Trade or Business School					
Correspondence or Night School					
College or Technical					

Degrees ... From What College? ...
Foreign Language Ability ...
Entertaining Ability ...
Athletic Activities ...
Community and Organization Activities ...
Hobbies ...
Activities During School Years ...
Military Service or Training ...

Self-Improvement Efforts Since Leaving School ...
Present Self-Improvement Efforts ...
Ultimate Ambition ...
Natural Aptness for What Kind of Work? ...
Work at Which Most Skilled? ...
Trade or Profession ...
Member of What Organizations? (Clubs, Lodges, Churches, Associations, etc.) ...
Do You Desire to Change Your Work? ...
Position Desired ...
Preparation for Work Desired? ...
Remarks ...

OCCUPATIONAL HISTORY WITH L. A. G. and E. CORP.

Date	DEPARTMENT	Nature of Work	Salary Initial	Salary Final

Face and reverse of employees' record form used by the Los Angeles Gas and Electric Corporation.

IDEAS FOR THE CONTRACTOR

Electrical Estimating for the Contractor—XVI

Knowledge of Pumps Necessary to Lay Out Satisfactory Installations Under All Possible Conditions

By J. R. WILSON*, Quality Electric Company, Los Angeles

The handling of liquid and semi-liquid substances by means of pumps is becoming of greater importance each year. The estimator who specializes on industrial installations or who is located in an agricultural or horticultural district will be called upon many times to recommend the proper type of pumps or to design complete pumping installations.

At least a working knowledge of pumps designed to meet efficiently particular conditions therefore should be acquired by electrical estimators. Today no argument is required on behalf of the employment of modern scientific irrigation which has become a thoroughly accepted part of agriculture. In the western states particularly, where irrigation plays such an important part in the prosperity of certain communities, the need for this knowledge will be many times apparent.

Electrical pumping has proved to be the most economical and efficient means of transporting liquids between two points, but this efficiency is dependent upon the particular pump being fitted to do the work desired. Each type of pump is designed to perform certain work under specified conditions of operation, therefore, a consideration of the limitations of each type is of paramount importance.

Pump Types

A great variety of pumps is used in modern industry, but as a general rule the tendency is to eliminate reciprocating pumps and to use centrifugal or rotary types. The type of pumps driven by electric motors includes acid pumps, air pumps, brine pumps, deep-well pumps, fire pumps and other high pressure types. The flexiblity of electric drive and the ease with which it can be adapted to automatic control places it far ahead of any other form of pump drive.

In addition to the types just listed there are irrigation, milk and cream, house service, sewage, mine service and man-hole pumps; vacuum, dredge, sump, paper pulp, sprinkler and other pumps, all driven by means of electric motors. The field is so large and the existing applications so numerous that it seems safe to say there is a type of pump suitable to meet every possible pump problem. The same statement applies to available forms of automatic-control equipment, of which there is an innumerable number of forms upon the market designed to operate under specified conditions. We have float and pressure switches for liquids, gases and air, contact-making gages and thermometers controlled by temperature, and other forms to meet any existing condition.

There are two general classes of centrifugal pumps: volute and turbine.

Quality or Price?

Old stuff, maybe, but just the other day a big department store job in a large city went to a cut-price contractor when it might have gone to a high-grade contractor and paid him a legitimate profit.

"I was prectly willing to pay the difference between the two bids," said the building owner, "if I had had any assurance that I was going to get a better job. But when both contractors talked nothing but price, and neither sold me quality, what was I to decide by? When it came down to a pure and simple price consideration, I had to assume an equal quality and there was nothing to do but take the lower price."

Always there will be someone willing to cut price. No amount of effort is going to prevent it. But there's no limit to quality. That is something too few people deal in. Quality is seldom sold—even the contractor who buys his own socks, suits, and automobiles on quality—wouldn't think of buying a cheap car because it is cheaper—he wants the best there is.

Give your customer credit for wanting the best. He will be glad to feel that you think he is that kind of man. Sell your jobs on quality and you can sell into them your rightful profit.

The man who sells Rolls Royce cars never figures how he can cut the price. He gets his profit without slicing off half to get the business. What's more, the people who want quality cars look him up to GIVE him the business.

The efficiency and adaptability of this type of pump are dependent upon the shape of the impellers and casing and the number of stages. The volute type consists of a casing of spiral shape with a gradually increasing water chamber, designed to convert velocity head to pressure head. In the turbine type is provided a series of diffusion veins or ducts between the impeller and casing. In this type the fluid leaves the pump at practically the same velocity as that of the impeller.

The rotary pump has a revolving impeller, which is usually shaped like the figure "8." The lobes act to force the liquid from the inlet to the outlet. A pair of mating impellers is used. Rotary pumps are particularly adapted to handle such semi-fluid substances as starch, glue, glycerine, tar, oil, sludge and muddy water. Most types are direct-connected to motors.

Classes of Pumps

To get a clear idea of the possibilities presented by electric pumping it will be well to consider the different classes of pumping and the types of pumps particularly suited to meet the requirements of each class.

Acid Pumps—For this class of service it is usual to specify small sizes of centrifugal volute or turbine types equipped with rotors and casings of non-corrosive acid-resisting materials, such as monel metal. They are designed for use in chemical factories, storage-battery manufacturing plants, and for pumping water containing acid.

Air Pumps are usually of single or multi-stage, high-pressure types, or of the figure "8" type of low pressure blowers. They are used in sets for airbrakes, hammers, drills, for activated-sludge sewage systems, pneumatic water systems, forges, garage pumps, transformer vaults, and a number of similar applications.

Boiler Feed Pumps.—Usually boiler-feed pumps are installed in dark, out-of-the-way places and are subject to neglect with consequent accumulation of dirt and grease. Under these conditions the motor-driven centrifugal pump has proved its worth because it occupies small space, is very reliable, is not subject to vibration, has high speed with consequent lower-operating costs and is extremely simple in construction—usually having a single moving part.

Brine Pumps are built for use in pickle and sauerkraut factories, refrigerating plants, etc. The impeller and shells are made of metal which will resist action of salt. These pumps are usually of centrifugal or rotary type of low or medium capacity.

Condenser and Circulating Pumps—Slow or medium-speed, single-stage, centrifugal, volute types usually are applied to this type of service to supply low-head surface condensers with large volumes of water. They generally are equipped with special priming devices.

Deep Well Pumps generally are of vertical volute or turbine-centrifugal multi-stage type. They usually are of medium capacity and high head for raising water from great depths and consist of a series of impellers lifting the water in stages. They sometimes are air-lift pumps with the air cylinders submerged, air from a compressor being used to raise the water to the desired height.

Drainage Pumps—Vertical sump types of small capacity controlled by float switches are used usually for pumping out sump pits, excavations, man-holes, basements, etc. Low-head, high-capacity centrifugal or screw types usually are used for large drainage or reclamation projects, made in several sizes, speeds and heads.

Fire Pumps are of multi-stage, centrifugal type usually equipped with both hand and automatic control, actuated by pressure variation. In some cases they are equipped with variable speed motors, so that pressure may be varied to meet demand. On sprinkler systems some types consist of variable stages, which are cut in series when the sprinkler operates. Fire pumps usually are built in standard capacities of 500, 750, 1,000 and 1,500 gal. per min.

For pneumatic sprinkler systems pumps are generally of triplex type and controlled by the compressor governor. Gravity systems are usually of a centrifugal type with a float switch.

Gas Pumps may be either single or multi-stage, high pressure or figure "8" rotary type. They are used to pump gas at low pressure into tanks, or into mains, or under pressure for long-distance transmission.

Electro-Pneumatic Pumps may be of centrifugal rotary, and reciprocating types pumping into a roof tank or closed tank using air pressure to assure a continuous water supply. They are controlled usually by a float switch or by a tank upressure governor and are used very generally in rural and suburban residences, country clubs, summer resorts, etc. Each installation is a problem in itself and the equipment must be selected carefully to meet specified conditions of head and capacity. By the use of a pressure regulator the motor can be adjusted to start and stop at predetermined high and low limits of pressure.

Oil Pumps—These pumps are used in oil-burning plants to pump the oil under pressure to the boilers. They are also used in oil-circulating systems to supply oil under constant pressure to bearings of turbines, generators, etc. Another use to which they are put is to circulate the oil in large transformers. They are used quite generally in garages and oil-filling stations. Duplex or triplex piston type pumps are used extensively for high pressure because they give a steadier pressure to the oil. Rotary pumps also are used very much on account of being continuous in action.

Vacuum Pumps are used for high vacuum condensing equipment and vacuum steam-heating systems. For high vacuum a turbine type of pump is used. The air is drawn into a chamber in which water is hurled by a rotating impeller. The air is then forced into a casing provided with numerous channels. The water functions as a sealing medium, compressing the air and forcing it outward into an annular casing from which it discharges. This same type of pump, using a mercury seal, is used for exhausting the air from incandescent lamp bulbs, mercury vapor, X-Ray, rectifier, vacuum and electron tubes.

Milk and Cream Pumps are generally of centrifugal type of low head and low or medium capacity. Casings and rotors are made of non-corrosive materials with special care in design to prevent any possibility of oil or grease coming in contact with the liquids pumped. These pumps are designed for quick and easy dismantling for cleaning. Inside surfaces always are fully machined in order to eliminate pits where germs might lodge.

A careful consideration of the different classes of pumping, enumerated above, will serve to convince the estimator of the vast possibilities in this one field of electric application. Manufacturers of pumping equipment all issue catalogs and instruction books covering the proper types and operation of pumps and it will pay the estimator to acquire these for reference.

Agricultural Pumping

The general subject of pump applications is too large to cover in detail in an article such as his. There is, however, one type of pumping which is of interest to every estimator—and that is the handling of water. Most pumping problems pertain to the handling of water, in some form and this generally for purposes of agriculture or horticulture. A brief consideration of certain rules pertaining to this branch of pumping may prove of value to a number of our readers.

The prosperity of any one engaged in agricultural pursuits depends upon the measure in which the soil responds to methods of cultivation. The productivity of any soil is dependent upon the proper amount of water being supplied to it, either naturally or by means of irrigation.

In localities where the natural rainfall alone is depended upon, the farmer or rancher must rely upon the uncertainties of nature in predicting the measure of his crops. This has led many ranchers to sink wells and install pumping plants and the increased crop yield has paid for the installation in a comparatively short period of time.

While the centrifugal pump is used very widely, very little is known about its operation or design by the majority of its users. Most centrifugal pumps are driven by electric motors and their operating costs are definitely known quantities. The question of pump efficiency is therefore of paramount importance.

Limitations

Generally speaking the standard horizontal type of pump, because of its efficiency and the small amount of attention required, will meet the demand of the average rancher where the water does not stand at any great depth below the ground. For best operation a centrifugal pump should not be required to pull over a maximum of 15 ft. suction. While it is possible to pump water, even under a suction head of 30 ft. the efficiency of the pump and the amount of water handled will be affected to a marked degree, this characteristic being very noticeable as the suction lift is increased above 15 ft.

Where the water level recedes too far, when the horizontal pump is in operation, it will be necessary to place the pump in a pit at such a level as to maintain the proper limit of suction. Such pits may vary from 4 to 5 ft. to as great as 75 or 80 ft. The deep well turbine was designed to meet this condition of operation, and should always be considered where the well is of the bored type, or of considerable depth. It is well to bear in mind that in the successful operation of the pump the most important thing is to get the water into the pump and this can be accomplished only by placing the pump as near the water level as practicable.

In a centrifugal pump there are certain fixed characteristics which develop during design and cannot be altered by adjustment on the job. For this reason the motor, especially in direct-connected types of apparatus, must be of such design as to operate efficiently with the particular pump it is desired to drive. Where it is possible to purchase both pump and motor from one manufacturer, the liability of selecting a drive too small for a particular installation is greatly reduced. In any case all equipment should be bought upon "guaranteed performance" specifications.

Estimating Pumping Capacities

Pumping usually consists of discharging a given quantity of liquid or semi-liquid substance, expressed in "gals. per min." or "pounds" against a resistance usually expressed in "feet head." If the liquid is heavier than water, it is necessary to multiply by the specific gravity. Table X gives the specific gravity of various liquids and gases, while others may be obtained from almost any standard engineering hand book. In order to lift a substance from one level to another an expenditure of energy is necessary. If all friction could be eliminated a

Loss of Head Due to Friction of Water in Pipes and Elbows

TABLE NO. I.

Loss of head in feet due to friction in various sizes of smooth, straight cast iron pipe per 100 feet discharging the given quantities of water.

Gallons per Min. Delivered	PIPE SIZES, INCHES—INSIDE DIAMETER													
	¾	1	1¼	1½	2	2½	3	3½	4	5	6	7	8	10
5	7.6	1.9	.71	.27	.09	.05	.01	....	....	....	....	....	....	....
10	29.9	7.3	1.4	1.0	.28	.09	.05	.01	....	....	....	....	....	....
15	66.0	16.1	5.5	2.2	.57	.18	.09	.05	.02	....	....	....	....	....
20	115.	28.0	9.5	4.8	.96	.32	.13	.07	.03	.01	....	....	....	....
25	179.	43.7	14.7	6.0	1.7	.48	.23	.09	.05	.02	.01	....	....	....
30	264.	63.2	21.0	8.6	2.1	.69	.30	14	.07	.03	.01	....	....	....
35	372.	85.1	28.9	11.6	2.7	.92	.39	.20	.11	.04	.02	....	....	....
40	461.	110.	37.0	14.9	3.7	1.2	.53	.25	.14	.05	.02	....	....	....
45	594.	145.	46.5	18.7	4.6	1.5	.64	.32	.16	.07	.02	....	....	....
50	.....	185.	57.3	23.0	5.6	1.9	.80	.32	.20	.09	.03	....	....	....
60	.....	253.	82.8	32.2	8.0	2.7	1.2	.55	.30	.11	.05	....	....	....
70	.....	340.	116.	46.0	11.0	3.5	1.4	.87	.41	.16	.06	....	....	....
75	.....	393.	129.	51.4	12.2	4.1	1.7	.90	.48	.17	.07	....	....	....
80	.....	442.	147.	57.5	14.5	4.6	2.0	.93	.53	.18	.07	....	....	....
90	.....	580.	184.	73.6	17.9	5.9	2.5	1.1	.60	.21	.09	....	....	....
100	.....	.....	228.	89.7	21.7	7.3	2.9	1.5	.74	.27	.11	....	....	....
125	.....	.....	367.	150.	34.3	10.0	4.6	2.1	1.2	.39	.16	0.09	....	....
150	.....	.....	516.	207.	48.8	16.1	6.5	3.1	1.6	.57	.23	0.13	....	....
175	.....	.....	.....	294.	64.6	21.7	8.6	4.2	2.1	.78	.30	0.16	....	....
200	.....	.....	.....	359.	86.2	28.6	11.5	5.4	2.8	.96	.39	0.28	0.16	....
250	.....	.....	.....	600.	137.	41.7	17.7	8.5	4.3	1.5	.60	0.34	0.18	....
300	.....	.....	.....	.....	195.	64.4	25.7	11.5	6.2	2.1	.85	0.39	0.26	....
350	.....	.....	.....	.....	258.	86.8	34.9	16.3	8.4	2.9	1.1	0.53	0.29	....
400	.....	.....	.....	.....	345.	114.	44.9	21.3	10.9	3.7	1.5	0.69	0.40	....
450	.....	.....	.....	.....	.....	.....	.....	.....	14.10	4.62	1.96	0.86	0.46	0.16
470	.....	.....	.....	.....	.....	.....	.....	.....	16.00	5.06	2.23	0.96	0.55	0.12
500	.....	.....	.....	.....	.....	.....	.....	.....	17.20	5.55	2.03	1.04	0.58	0.20
750	.....	.....	.....	.....	.....	.....	.....	.....	.....	11.28	4.87	2.34	1.24	0.42
1050	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10.30	4.16	2.51	0.74
1500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.15	4.48	1.61

When pipe is rough add 15%; when very rough add 30%.

TABLE NO. II.

Loss of Head in feet due to friction in various sizes of smooth 90 degree elbows, discharging the given quantities of water.

Gallons per Min. Delivered	PIPE SIZES, INCHES—INSIDE DIAMETER												
	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10
5	.161	.0621	.0184	.0115	.0046	.....	.....	.....	.....	.....	.....	.....	.....
10	.644	.2162	.0713	.0414	.0138	.0069	.....	.....	.....	.....	.....	.....	.....
15	1.449	.4876	.1587	.092	.0322	.0115	.....	.....	.....	.....	.....	.....	.....
20	2.576	.8648	.2829	.1587	.0575	.0276	.0115	.....	.....	.....	.....	.....	.....
25	4.002	1.3155	.4462	.2484	.0874	.046	.0184	.....	.....	.....	.....	.....	.....
30	.....	1.9435	.6394	.3611	.1265	.0644	.0253	.....	.....	.....	.....	.....	.....
35	.....	2.645	.8740	.4935	.1748	.0851	.0345	.0207	.....	.....	.....	.....	.....
40	.....	3.450	1.1385	.6394	.2254	.1127	.046	.0253	.0161	.....	.....	.....	.....
45	.....	4.370	1.4389	.8096	.2875	.1426	.0538	.0345	.0207	.....	.....	.....	.....
50	.....	.....	1.771	.989	.3519	.184	.0735	.0391	.023	.....	.....	.....	.....
60	.....	7.774	2.553	1.426	.506	.2576	.1012	.0598	.0345	.0138	.0069	.....	.....
70	.....	10.580	3.496	1.978	.6992	.3404	.138	.0805	.0483	.0207	.0092	.....	.....
75	.....	12.190	4.002	2.254	.805	.3956	.1656	.092	.0552	.023	.0115	.....	.....
80	.....	13.800	4.554	2.553	.9016	.4508	.184	.1012	.0621	.0276	.0115	.....	.....
90	.....	17.480	5.750	3.243	1.150	.5704	.2392	.138	.0805	.0322	.0161	.....	.....
100	.....	.....	7.084	3.956	1.4076	.736	.2944	.1564	.0989	.0391	.0184	.....	.....
125	.....	.....	.....	6.256	2.231	1.104	.460	.2576	.1541	.0621	.0299	.....	.....
150	.....	.....	.....	9.016	3.197	1.5755	.6578	.368	.2208	.0897	.0437	.....	.....
175	.....	.....	.....	12.236	4.370	2.1505	.8970	.5014	.3036	.1219	.0598	.....	.....
200	.....	.....	.....	15.824	5.612	2.944	1.1776	.6266	.3956	.1564	.0736	.....	.....
250	.....	.....	.....	.....	8.878	4.393	1.840	1.0258	.6164	.2507	.1196	.04	.....
300	.....	.....	.....	.....	12.788	6.302	2.622	1.472	.8832	.3588	.1748	.06	.....
350	.....	.....	.....	.....	.....	.....	.....	.....	1.24	.490	.24	.09	.....
400	.....	.....	.....	.....	.....	.....	.....	.....	1.59	.627	.29	.10	.....
450	.....	.....	.....	.....	.....	.....	.....	.....	2.01	.81	.39	.13	.053
500	.....	.....	.....	.....	.....	.....	.....	.....	2.47	1.007	.48	.16	.065
750	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.24	1.09	.36	.145
1050	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.02	2.41	.76	.258
1500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.44	.585

certain amount of power would lift a certain amount of liquid to a definite height.

That is "theoretical horsepower," but owing to the friction of the substance in the pipe, and the mechanical friction of the pump itself, the actual horsepower required always exceeds the theoretical. As an example: To pump 500 gallons of water per minute, 50 ft. high requires 6.6 theoretical horsepower. Actually to pump this water through a 5-in. pipe with a pump of 65 per cent efficiency, requires 10.15 hp. The ratio of the theoretical horsepower to the actual horsepower is defined as the efficiency of the pump and varies with different types and makes of pumps. Efficiency is the percentage of horsepower supplied which is turned into useful work. In the above example 10.15 is the actual horsepower required, while 6.6 is the theotretical, and 6.6 divided by 10.15 equals 65 per cent pump efficiency.

The economy of the pump is determined by its efficiency and as the operation of the pump extends over many years it can be seen readily that efficiency is of the utmost importance. The efficiency determines the operating and maintenance costs, so that a pump which is low in first cost may prove to be very expensive in the end. Efficiency presents an actual tangible saving, and provides the only way of computing relative values of any class of machinery.

For purposes of irrigation it is usual to allow one cu.ft. per sec. for each 70 to 100 acres. Under favorable soil conditions and the use of diversified crops it is not uncommon to irrigate as high as 160 acres with one cut.ft. per sec. In most sections of the country the irrigation season is assumed to last about four months of the year, the water being pumped 24 hours per day.

The resistance against which water is pumped consists of the height it is to be lifted (pumping against pressure is the same as lifting it an equivalent number of feet), plus the pipe friction (between the points of intake and discharge) expressed as loss of head in feet, plus the given velocity—the result of which is known as the "total pumping head." The friction loss included in the total head can be computed from Tables I and II shown herewith. These tables are based upon values which are adequate for general estimating purposes. Tables covering pipes larger than 10 in. may be obtained from any manufacturer of pumps.

TABLE X

WEIGHT AND SPECIFIC GRAVITY

LIQUIDS					
ACID -HYDROCHLORIC	74.5	0.0431	1.195 - 46		
" -NITRIC	95.39	0.0552	1.530 - 59		
" -SULPHURIC	114.35	0.0662	1.834 - 64	0.335	
ALCOHOL -GRAIN	50.316	0.0291	0.807 - 32	0.640	
" -WOOD	50.504	0.0292	0.810 - 32	0.601	
AMMONIA	36.544	0.0245	0.823 - 32		
GASOLINE	45.852	0.0266	0.737 - 60		
TAR	62.35	0.0361	1.000 -		
TURPENTINE	53.43	0.0315	0.873 - 61	0.441	14
VEGETABLE OIL	57.736	0.0334	0.926 - 61		
WATER	62.355	0.03608	1.000 - 39	1.000	32
GASES		WT. CU FT GRAINS			
AIR	0.08071	564.97	1.000 - 32	0.8374	
AMMONIA	0.0475	332.5	0.589 - 32	0.5226	
HYDROGEN	0.00559	39.13	0.0692 - 32	3.4090	
NITROGEN	0.0753	546.1	0.9701 - 32	0.8436	
OXYGEN	0.0892	624.4	1.105 - 32	0.8175	

Contractor Takes His Own Red Seal Medicine

Don Heumphreus, Santa Barbara Electragist, Builds Himself a Well Designed Complete Red Seal Home

Red Seal, like charity, should begin at home, thinks Don Heumphreus, of the Heumphreus-Smith Electric Company, Electragists of Santa Barbara. Accordingly in designing and building his new home at 3201 Calle Cedro Avenue, Mr. Heumphreus made it completely electric and moreover obtained for it the Red Seal emblem.

Primarily the Heumphreus home has been designed for comfort and convenience. Just because he was himself an electrical contractor influenced Mr. Heumphreus neither to underdo nor overdo the equipment of his home. True, he was determined to have the complete convenience if possible, but he achieved it without overloading the house with appliances or wiring. Everything installed must have a logical excuse for being there and an economic excuse as well. Particular attention was paid to control of lighting and heating, from the electrical standpoint, and to arrangement of rooms from the construction angle.

Entering the house from the back porch, the true entrance of the home as far as it is to be considered as a home laboratory or workshop, a number of interesting things are to be found. A 3-way switch controls the lights to the back porch. The back step, yard and front of garage are controlled by another 3-way switch. A 3-way switch in the garage also controls this lighting.

The rear porch has a power plug for a hotplate, to use for the wash boiler, and a 220-volt outlet for the electrically heated ironer; a 110-volt outlet for the washing machine is adjacent to the stationary tubs. The 5-kw. Hotpoint electric water heater is located in a closet at the end of this porch.

Often coming in from a job in soiled clothes, Mr. Heumphreus provided a small washroom and clothes closet for himself off one side of the back porch. A 3-way switch controls light for this room. This washroom has an entrance into his bedroom, for which a 3-way switch is provided, controlling light from the rear entrance or from the front hall. The room is lighted by four brackets and is provided with 2 duplex convenience outlets, all 6 of which are on a circuit of No. 12 wire. A heater outlet for a 1/5-kw. heater is provided. Lights on pull chain are found in all closets in the house which are cedar lined for moth protection. The front bedroom is also lighted by three brackets and has 2 duplex outlets, a heater outlet and a center light on a switch.

A short hall connects bedrooms and bath. The hall light may be controlled from the dining room, the front or rear bedroom, the bothroom, and kitchen. The bathroom is well equipped electrically. A 2-kw. flush type Wesix heater is set in the wall, controlled by a wall switch at the door. The bathroom is lighted by four lights, all controlled at the door, 1 ceiling light, 2 bracket lights over the mirror, and a water-proof light over the shower.

In the dining room one has the choice of convenience outlets almost anywhere. There are four outlets. The dining room table is itself wired with a convenience outlet from a floor outlet in the center of the room. A call plug located under the table is handy when entertaining. The room is heated by a 2,000-watt Majestic baseboard heater, placed under the windows. Three brackets light the room. The outlets in all rooms are so arranged that furniture may be moved to any desired location and still allow for convenience. A 4-way switch controls light to hall, living room, or kitchen.

Living room lighting consists of a center light, controlled on a 4-way arrangement so that it may be lighted from the entrance hall, dining room, or sewing room; three brackets, and mantel lights available from two plug outlets set flush instead of actual installing brackets, and used for candelebra or other fixtures, This room, too, is heated by a Majestic heater. It is equipped with radio outlets for antenna and ground and near the fireplace has a 220-volt, 5-kw. outlet for a glo-log. The fireplace is equipped with dampers necessary to successful electrical heating in this manner. There are three wall outlets and two floor outlets to care for davenport or table and allow any arrangement of furniture.

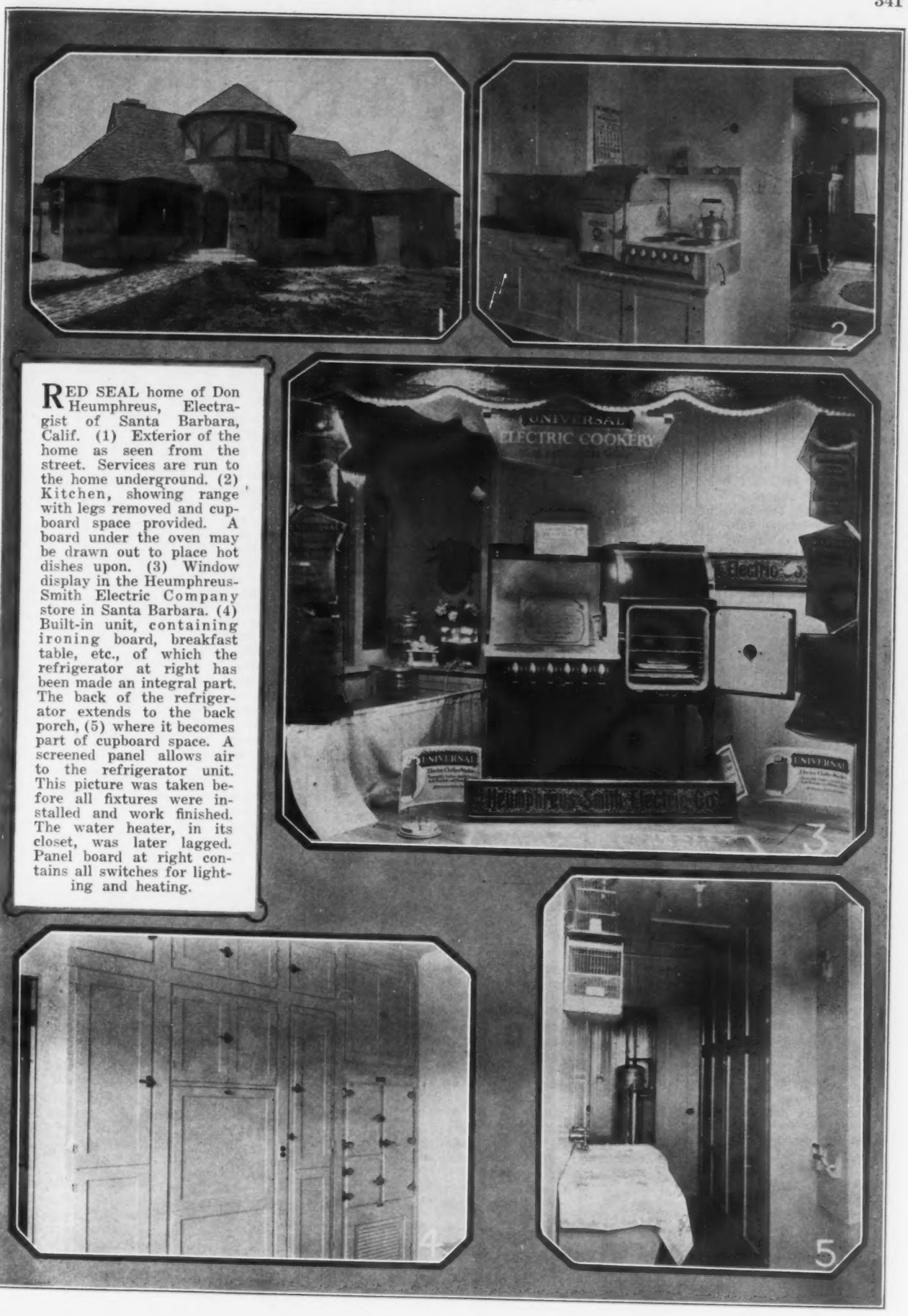
Kitchen arrangement is unique in many respects. The legs were removed from the Universal electric range, which was set upon cupboards. A shallow shelf under the range is used for storing pan covers and frying pans. A deeper shelf allows for pots and pans. A tray board pulls out under the oven, which has a side opening door, to ollow for setting hot pots and pans from the oven. The range is the type equipped with a stainless steel oven; is of grey enamel finish and of 8,550-watt capacity.

The center light in the kitchen is controlled on a 4-way switch, from service porch, sewing room, dining room or kitchen. The sink light is on a switch instead of a pull chain to eliminate any possible danger resulting from operation of the light with wet hands.

A Servel electric refrigerator is set flush with the cupboards on one side of the kitchen, the extra depth of the machine being taken up on the back porch. The motor has been cut over to use on a 220-volt circuit, giving improved operation. Ventilation of the motor and coils is provided by screen over the motor housing on the back porch side of the refrigerator. The refrigerator front is intergral with a Peerless master-built unit, consisting of a folding table, a cooler, a broom closet, ironing board, and cupboard. An outlet in this unit provides a place to attach the toaster or waffle iron for brkeakfast in the kitchen.

A service of three No. 2/0 wires is brought to the house down the pole and underground to the rear of the lot. All conduit used in the house is galvanized. The main switch, range switch, water heater switch and distribution panel are combined on the back porch on one A-G Panel board.

One of the niceties of the Don Heumphreus establishment, and one much appreciated in practice, is that one key is used to allow admission to the front, rear and garage doors.



RED SEAL home of Don Heumphreus, Electragist of Santa Barbara, Calif. (1) Exterior of the home as seen from the street. Services are run to the home underground. (2) Kitchen, showing range with legs removed and cupboard space provided. A board under the oven may be drawn out to place hot dishes upon. (3) Window display in the Heumphreus-Smith Electric Company store in Santa Barbara. (4) Built-in unit, containing ironing board, breakfast table, etc., of which the refrigerator at right has been made an integral part. The back of the refrigerator extends to the back porch, (5) where it becomes part of cupboard space. A screened panel allows air to the refrigerator unit. This picture was taken before all fixtures were installed and work finished. The water heater, in its closet, was later lagged. Panel board at right contains all switches for lighting and heating.

BETTER MERCHANDISING

Let There Be Light---This Winter

Lighting, Whether Commercial, Home or Industrial, Should Hold Stage During Autumn and Winter

Fifty Cents a Customer Quota Set in Campaign

Quotas were given districts of the Pacific Power & Light Company of Washington, Oregon and Idaho, to equal 50 cents a customer as the goal for a Mazda lamp campaign which started with a whirlwind effort on Sept. 1. Before nine days had passed the average of sales over the entire system had reached 7½ cents per consumer and the sale of lamps exceeded the lamps sold for the same period of last year by 211 per cent. On Sept. 11 the districts had sold an average of 1,040 lamps a day, a total of 9,360 lamps during the nine working days.

The lamp campaign undertaken by that company is being planned to continue to the first of the year. Up to the time of the campaign the average lamp sales per consumer amounted to but 27 per cent a year, indicating the size of the task laid out in this campaign.

The campaign is one of the first of its kind in the West, it is claimed. Lamps are being sold this year in all of the districts of the company, some of which have not previously merchandised lamps. The Edison Lamp Works is co-operating with the company in its campaign.

Electric Advertising Talk Wins Ad Club Trophy

"The Electric Way Is the Modern Way to Advertise," a talk by P. P. Pine, power sales engineer of the San Diego Consolidated Gas & Electric Company, recently was awarded a trophy for the best five-minute talk before the Advertising Club of San Diego. A silver cup is awarded each year by Thomas Shore, president of the Ad Club, to stimulate interest in public speaking on advertising topics. Mr. Pine's talk, containing much good sales argument for any electrical contractor, follows in part:

In these days of increasing prices and narrowing margins of profit in business, executives are endeavoring to reduce expense as never before and the advertising appropriation is securing its full share of attention. Let us consider for a few moments an advertising medium which is available today at pre-war price in the face of an average increased commodity cost of more than 60 per cent. I refer to electricity.

The cost of electrical energy has been kept down to pre-war level by the increased efficiency of production, making two pounds of coal or oil generate as much as required three pounds in 1914, by the interconnection of individual companies' lines into superpower systems.

In this country the electrical industry has not been handicapped by governmental interference and operation. Individual initiative has had its opportunity, with the result that as much electrical energy is generated in the United States today as in all the rest of the world put together, with correspondingly reduced costs due to quantity production.

Light Up for Dark Days and Nights

Shortening days of autumn and winter are made for the lighting salesman.

Everywhere the demand of the eyes is, "more light!" The desire to have this demand satisfied should prove to be the best sales help in the salesman's briefcase.

Lamp salesmen, alive to the possibilities, may relamp every empty socket in the home. Summertime nights cause empty sockets to go neglected. But winter comfort demands light.

Refixturing of homes now equipped with out-of-date and inefficient fixtures, opens further possibilities.

Commercial lighting should be at its best. Store windows need more light to compete with better-lighted windows eveywhere about them. Store interiors are now in active competition with each other. There are still thousands of small stores lighted by eye-damaging bare lamps of high intensity on drop cords and placed in the line of vision.

Industries still need better lighting despite the completion of the Industrial Lighting Campaign. Enough good installations were made under the swing of that campaign to provide concrete examples of what good lighting can accomplish in better production, less spoilage, and fewer accidents. Industrial lighting should be easier to sell than it was before that campaign.

The old jobs need more attention than the new jobs. The field is wider. The need is greater. The profits await those who will SELL.

Consider the Electric Sign

Ordinarily when we consider electrical advertising we think of electric signs. Originally these were used merely to spell out the name of the firm or the product in electric lamps, but they have been developed by the use of beautiful and spectacular designs until today this is the most striking and effective method of putting a product before the public. Electric signs take advantage of the highest receptivity of the minds of the crowds as they stroll the streets at night, unhurried by business cares. They are the only method of securing life-like animated figures, and electric signs are the most striking advertising medium in the world today as they flash their message in letters of fire against the background of the night.

Street Lighting Helps

White way lighting is coming into increasing demand as an advertising medium. Who can estimate the publicity value of the "great white way" of New York City with its 1,000,000 electric lamps? Business men in many communities have changed the shopping center from one point in the town to another by the use of this medium, attracting the crowds of shoppers to the more brightly lighted section as unerringly as iron filings are attracted by the magnet. That San Diego is beginning to appreciate this form of advertising is shown by the fact that as many ornamental lighting standards have been installed in this city in this one year—1925—as in all its previous history.

How Is the Store Lighted?

Much has been said regarding the psychological moment of closing a sale, but when is a more opportune time of overcoming sales resistance or changing the buying habits of a prospect than when he is in front of your store? Effects can be secured by color window display lighting which will cause a large number of passersby at night to stop and examine your goods. The use of an abundance of light in a store interior has an advertising value.

It should not be necessary for the prospect to bring the goods to the win-

dow in order to examine them, nor for him to go away dissatisfied because insufficient illumination does not allow him to make certain that they suit his requirements. Besides this, the use of an abundance of light lends that air of cheerfulness which is so conducive to the buying state of mind. That is the reason why some chain stores who keep account of their costs even to the extent of figuring their wrapping paper expense per dollar sale, are extravagant users of light, realizing that for every dollar spent therefor they secure more than a dollar in return.

Deluxe illumniated billboards and radio broadcasting are up to date advertising mediums which have secured results, but I have not time to discuss these now.

On account of its economy, its efficiency and its effectiveness, the use of electricity as an advertising medium is coming into increasing demand. In this field, as in a dozen and one other realms of human activity today, the ELECTRIC WAY IS THE MODERN WAY.

Manufacturer Offers Lighting Estimating Service

A simplified plan to further man-to-man co-operation between manufacturer, jobber and dealer has just been introduced by Curtis Lighting, Inc., and is said already to have taken hold quietly and with success.

It is entitled the "Jerry Plan," and provides an easy and effective means for these reflector manufacturers to help their jobbers' salesmen and dealers to secure more good prospects for show window lighting. Besides this, it "personalizes" the service rendered to the distributor salesmen by the Curtis engineering department.

"Jerry" is J. L. Stair, chief engineer for Curtis Lighting, Inc. "Jerry" promises to recommend the suitable X-Ray reflectors for a prospect's show windows and do the greater part of the work if the salesmen will supply him with the necessary information about the job in a "Sale Starter," a folded sheet addressed to Mr. Stair at the home office of Curtis Lighting, Inc., in Chicago. A gummed flap seals it ready for mailing. When unfolded it consists of a center sheet and two side flaps. After the space for the name and address of the prospect, there are lines to be filled out giving names of the salesman, the jobber, dealer or central station he is working with, the company to which the recommendation should be sent and the electrical dealer to sell the job. The salesman is also asked to tell whether or not the local central station is co-operating in the sale.

On one side flap are sketched eight general styles of window lighting, and the salesman is requested to check the style used at present in the prospect's show window. On the other flap is a cross-section of a typical show window with lettered dimensions. Below in question. There is also a cross-sponding letters, and the salesman can fill this in giving the size of the window in question. There is also a cross-section area of the "Sale Starter" for a rough floor plan of the window.

An engineering recommendation is then sent the salesman and assistance given him by the company's representative in making the sale. Results from the plan are already reported to be showing the idea a good and a workable one.

"Trouble" Advertisement Brings Flood of Inquiries

That there is an opportunity for the small electrical contractor-dealer to establish a good business in the repairing of electrical troubles of minor character is given unusual support in the experience of the Schockett Electric Company of Denver. Mr. Schockett ran the advertisement illustrated here for five weeks, just once each week, in the largest daily evening paper in Denver. Then the fun began.

The replies, inquiries and requests for prices came flooding in, and work piled up to such an extent that he had to discontinue the advertisement. Mr. Schockett declares that the results obtained were just 100 times as much as his previous efforts in using direct-mail.

The Schockett Electric Company service wagon was kept so busy tend-

Electrical Troubles
Around the Home Need Not Worry You Any Longer
Phone us any time. Broken wires, burnt out fuses, globes, switches, disconnections, electric washers, electric irons, extensions or anything electrical.
Our service truck fully equipped with all the necessary tools and materials, managed by a competent licensed electrician, will be in your neighborhood tomorrow.
Call Main 8228 and avail yourself of this time and money-saving electrical service plan. Our electrician will call on you and tell you in advance what the charges will be.
No delays, no disappointments. You save money on this new method of electrical repairing. Call NOW.
The Schockett Electric Co.
OFFICE M-8229. WIRING AND FIXTURES Offices and Showrooms, 408 15th St. NIGHT M-8308

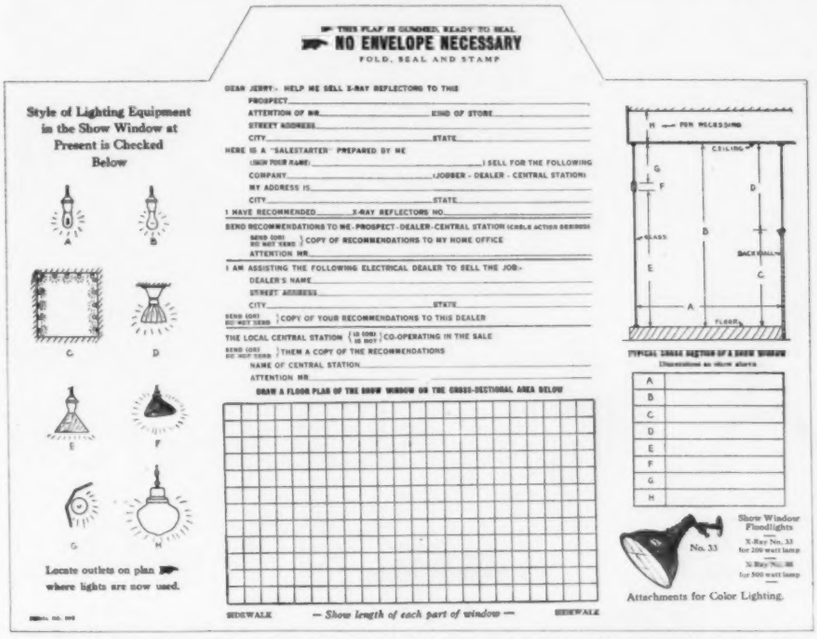
This advertisement started the deluge of orders for repair work, estimates, and advice. Run once a week for five weeks, it had to be discontinued because the work was piling up too fast.

ing trouble calls elicited by the advertisement that it could not attend to other important work for the company. And one of the most pressing problems in connection with the idea was that the proper type of man to handle the business for the company was hard to get. It was impossible for Schockett

The service car of the Schockett Electric Company, used in making repair calls.

or his foreman to give their entire time to the work, which seemed to require it. The job required besides a good journeyman, one who could estimate, advise and discuss the preliminaries concerning various jobs, and sell as well.

Yet the experience of the Schockett Electric Company proves that there is a demand for just this sort of service, and that there is opportunity for someone to specialize in this particular work and build up a good business, letting the public know that such service is available through good advertising.


THIS FLAP IS GUMMED, READY TO SEAL
NO ENVELOPE NECESSARY
FOLD, SEAL AND STAMP
Style of Lighting Equipment in the Show Window at Present is Checked Below
Locate outlets on plan where lights are now used.
DRAW A FLOOR PLAN OF THE SHOW WINDOW OR THE CROSS-SECTIONAL AREA BELOW
SIDEWALK
— Show length of each part of window —
SIDEWALK
Show Window Floodlights
No. 33
Attachments for Color Lighting.

Folding mailer upon which the salesman or dealer records information regarding a window lighting prospect from which "Jerry" makes the estimate and recommendations for layout.

Hoover Company Offers Prizes for Window Display Contest.—To be known as "Hoover week," the week of Dec. 4-11, will be made the annual mid-winter window-display competition time for Hoover dealers this year, according to rceent announcement. Prizes of $100, $85, $70, $50 and $25 for the best 12 window displays of Hoover cleaners will be awarded. Electric dealers, hardware and furniture stores are eligible to the contest. Help is offered by the company to aid in making attractive displays for entry into the contest.

Hotpoint Christmas Range Sales Plan Detailed in Manual

By means of an attractive brochure in which is outlined a complete sales plan for electric ranges as Christmas gifts to women of the home, the Electric Appliance Company has recently announced its 1926 Christmas sales plan for ranges. The slogan adopted is "What Mother Really Wants."

The booklet starts with the reasons for inaugurating the campaign, offers time-payment information, urges the enlistment of employee support of the plan, outlines advertising plans and offers material for an advertising campaign in direct mail, letters, newspaper advertising, window displays, store demonstrations, guessing contests, truck banners and car cards.

The all-white Hotpoint automatic range and the de-luxe automatic are the two models featured in the campaign, for which national advertising is also being done.

Merchandiser Wins McGraw-Hill Honor for Sales Policies

With the following citation, one of the McGraw-Hill awards for 1926 was presented to G. Fred Laube, at the Electragist convention at Cedar Point, Ohio, recently. It is testimony of recognition of a valuable contribution to the art of electrical merchandising.

G. Fred Laube, president Laube Electric Company of Rochester, N. Y., believing that there is a considerable element of nuisance involved in the high pressure door to door canvassing method of selling electrical appliances, which he feels affects the good reputation of all the local appliance merchants, initiated in his store a method of merchandising in which he relied upon excellence of display and a thoroughly organized program for the education of prospects and customers. Establishing what he calls an "electrical department store" in which the display of associated lines is very carefully studied, he has succeeded in bringing to his store by invitation successive groups of women for the inspection of specific appliances and instruction in their use, without obligation or influence to buy.

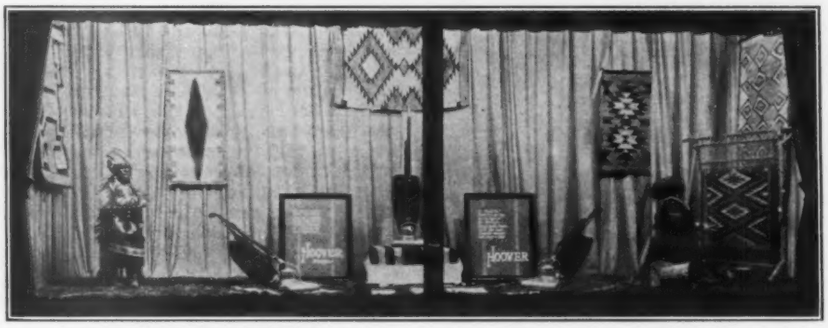
At the same time, by displaying together with standing lines and in direct comparison, the low priced appliances commonly featured in drug and department stores, he has made a frank constructive demonstration of quality, and while offering the full range of prices has greatly increased the popular preference for better goods.

This method happily has proved profitable, has resulted in raising the dignity of electrical appliance selling in Rochester and has benefited all local dealers. In recognition of the principles involved in this constructive contribution to the advancement of the contractor-dealer branch of the electrical industry, the judges have extended to Mr. Laube a certificate of Honorable Mention, given under the James H. McGraw Award for 1926.

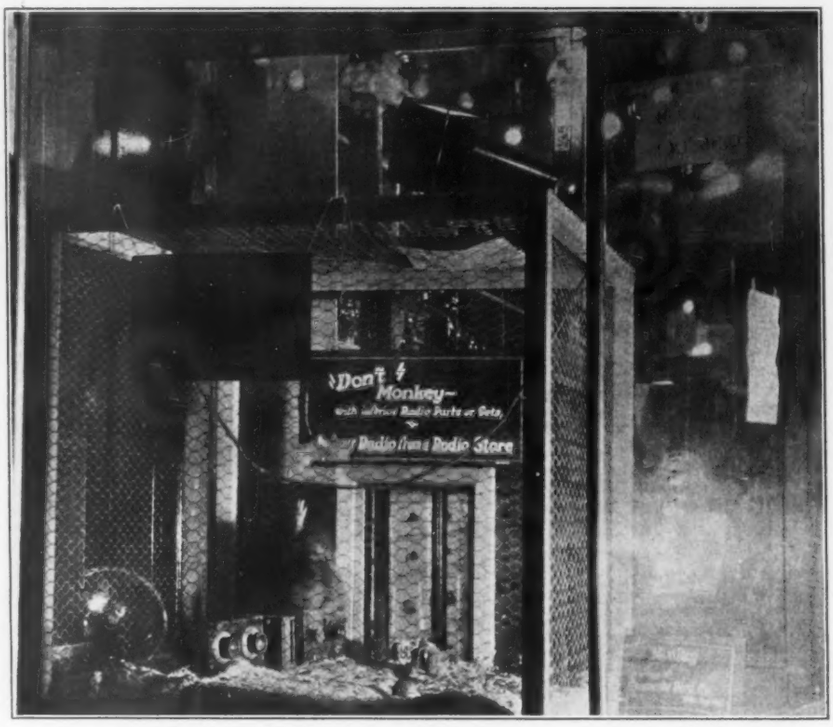
Place Appliance Shops in Piggly-Wiggly Stores.—Frank E. Paige has just opened the third Thor Electric Shop which he has located on floor space leased in a Piggly-Wiggly store at 243 East San Fernando Boulevard, Burbank, Calif. Another appliance specialty shop was recently opened in a Piggly-Wiggly store at 269 Sherman Way, Van Nuys, Calif. The location is claimed to give his store access to hundreds of housewifes in the course of their shopping each day.

The Dalles Wins Hughes Trophy in Range Campaign.—The George A. Hughes trophy, presented by the Edison Electric Appliance Company, was won by The Dalles district of the Pacific Power & Light Company in the annual Hotpoint range campaign this year.

Window display in the Lancaster district office of the Southern California Edison Company showing what can be done with the stock window trim furnished by the manufacturer.

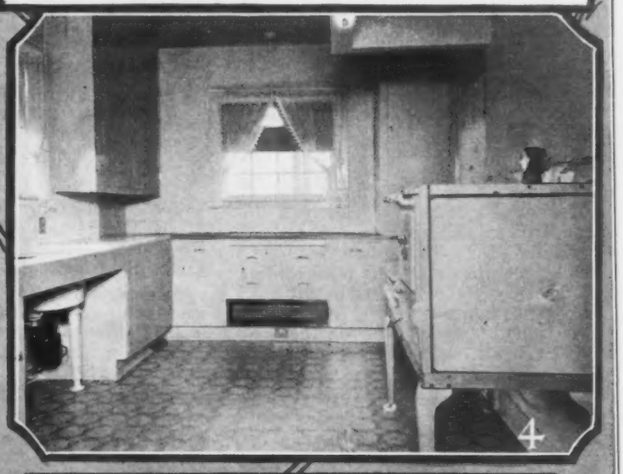


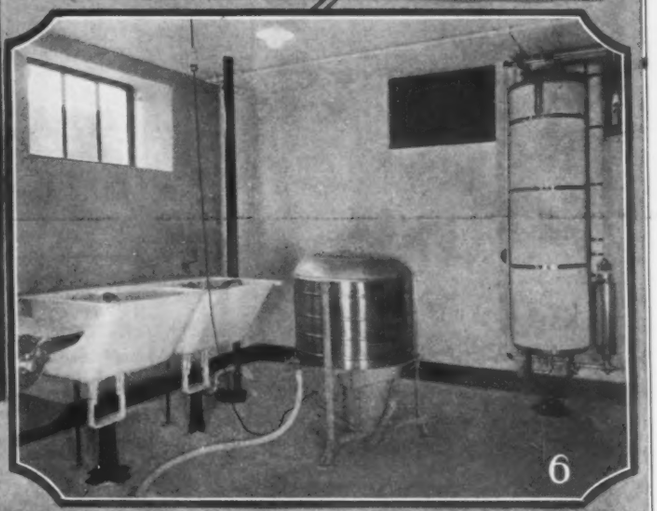
A fifty-dollar prize vacuum cleaner window designed and executed by Eugene T. McSpadden, display manager of the Public Service Company of Colorado. The contest was arranged by the Hoover Suction Sweeper Company. The two signs read (left): "It's quite a step from the crude days of weaving these rugs to the modern cleaning of them with the new improved Hoover." (Right): "Be modern. Don't try to live in the age of the Navajo. Equip your home with the best cleaner money can buy—the Hoover."



"Don't Monkey with Inferior Radio Parts or Sets." This slogan, surrounded by a lifelike monkey cage in which radio parts were held prisoners, attracted considerable attention in the windows of the California Mechanical & Electrical Engineering Company, Sacramento, Calif., where it was displayed. "Buy Your Radio from a Radio Store" was the forceful follow-up message.

COMPLETION last November of Julia Groo's $15,000 prize home, won in the National Home Lighting Contest, 1924, was made the occasion for Portland's first electric home exhibit. Registered visitors, conducted through the home during the month display of the home, numbered 23,148. They were shown a home tastefully decorated, well lighted, adequate in convenience outlets, telephone and radio plugs, completely furnished with modern housekeeping aids, and heated by built-in electric heaters. (1) Hallway. (2) Living room. (3) Dining room. (4) Kitchen. (5) and (6) Basement laundry room and switchboard.





NEWS OF THE INDUSTRY

Unconditional Ratification of Six-State Compact Refused by California

By a vote of 34 to 3 in the Senate and 68 to 8 in the Assembly the California legislature, assembled in special session Oct. 22 at the call of Governor Richardson (Journal of Electricity, Oct. 15, p. 309), refused to ratify unconditionally the six-state Colorado River Compact. Instead a resolution was passed by both houses reaffirming the reservations to California's acceptance of the contract as added during the 1925 session of the legislature. The resolution stated that "it is unnecessary and inadvisable to take action respecting the Colorado River compact as contemplated in the call for the session," and "that the plan of handling interstate rights and relations respecting the waters of the Colorado River, as expressed in the Swing-Johnson Bill, is hereby approved and assurance is hereby given that, upon the passage of said bill the state will take such action as may be necessary to render the bill operative and the compact unconditionally effective." The resolution was introduced by State Senator Ralph E. Swing of San Bernardino, brother of Congressman Phil Swing, co-author with Senator Hiram Johnson of the Swing-Johnson Bill.

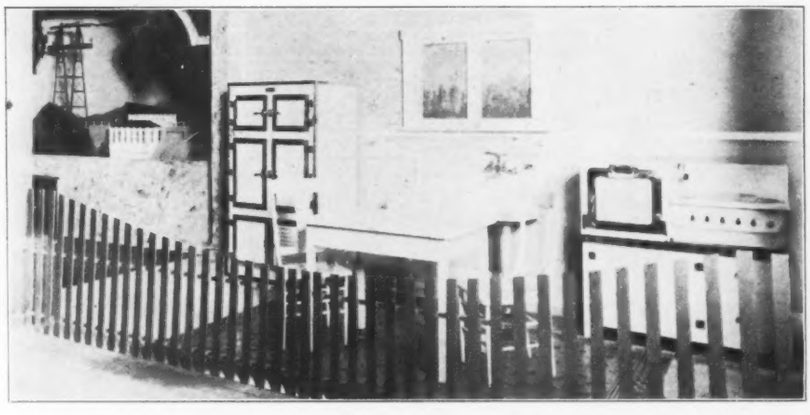
Governor Richardson's call for unconditional ratification was based on the ground that no action could be taken by Congress at the forthcoming session on the Swing-Johnson Bill until the six-state compact had been ratified unconditionally by California because the bill contains a provision requiring the approval of six of the seven signatory states "without condition, save that of such six-state approval, and until the president by public proclamation shall have so declared." The governor further pointed out, "this bill further makes the approval of the compact by the United States 'effective when at least six of the signatory states, including the state of California, shall have approved or may hereafter approve said compact as aforesaid and shall consent to said waiver.'"

The reservation to the six-state compact added by the 1925 legislature stipulated that California's ratification should not become effective until after a reservoir of 20,000,000 acre-ft. capacity at or below Boulder Canyon on the Colorado River had been authorized for construction by the United States.

Wheeler Fish Lift Approved by Oregon Fish Commission

The Wheeler patent fish lift, a device for raising fish over dams, has been approved officially by the Oregon Fish Commission. The lift was invented by J. R. Wheeler, district manager in Reedsport, Ore., for the Peoples West Coast Hydro-Electric Corporation.

A description of the lift and of the successful demonstration of its use appeared in the Oct. 15 issue of the Journal of Electricity on p. 308.



The Utah Power & Light Company's exhibit at the Utah State Fair, held recently in Salt Lake City, was awarded first prize. One of the principal attractions at the fair, it represented a miniature power plant. By clever mechanical arrangement a moving wheel which represented a generator was visible through the windows, the visibility being limited in order to give the proper effect of the interior. Water in the reservoir seemed to be in motion, and water appeared to be flowing over the dam. In the background, which presented a beautiful setting, clouds were moving continuously. The general effect was natural to a remarkable degree. In connection with the power plant portion of the exhibit a model kitchen was shown, and the message conveyed through the entire display was the impression of service and efficiency at the turn of a switch.

Modesto Power Contract Ratified by San Francisco Board

The contract between the city of San Francisco and the Modesto Irrigation District for the furnishing of power for standby service from the city's Hetch Hetchy plant finally has been ratified by the Board of Public Works of San Francisco. The contract was accepted by the irrigation district on Oct. 4. Under the provisions of the agreement the city must furnish standby service to the extent of 3,000 kw. at a flat charge of $4,200 per annum and a kilowatt-hour charge of 4.7 mills for all energy used.

Official protest against the terms of the contract was made by M. M. O'Shaughnessy, city engineer of San Francisco, on the grounds that the price failed to reimburse the city for the cost of service (Journal of Electricity, Sept. 15, p. 216), and the ordinance passed by the Board of Supervisors ratifying the contract was vetoed by the mayor on the same grounds and again passed by the supervisors over his veto. (Journal of Electricity, Oct. 1, p. 310.)

In order to receive the power the Modesto Irrigation District is to build a substation at a point in the district adjacent to the Moccasin-Newark transmission line. The agreement specifies that the power can be used only for pumping and municipal purposes as provided for in the Raker Act.

New Rate Schedule Put in Effect by B. C. Electric Company

With reductions and new rates put in effect in rural districts on Nov. 1, all domestic and commercial lighting customers of the British Columbia Electric Railway Company in the mainland district are now on two-step rates.

In country districts and towns several domestic rates have been in force, the most extensive being a block rate starting at 11 cents gross with a prompt-payment discount of 20 per cent. The new domestic rate is 7 cents net a kw-hr. for the first 3 kw-hr. per 100 sq.ft. of floor area and 3 cents a kw-hr. for all current in addition.

This conforms with the type of rate in Vancouver and suburbs where, however, the steps are 4½ cents and 2 cents and 5½ cents and 2 cents. Altogether some 5,000 accounts are affected.

The new commercial rate is 7 cents a kw-hr. for the first 100 kw-hr. per 100 kw. of demand and 3 cents a kw-hr. for all current in addition. About 1,100 customers are affected by this rate, which replaces a block rate beginning at 11 cents gross or 8.8 cents net.

Quantity discounts are allowed customers with installations of more than 10 kw. but only on the first step of the rate.

Idaho C.R.E.A. Reports on Farm Electrification in State

Idaho's electric power installation on its farms is in larger proportion than any other state except the three Pacific Coast states and two New England states, according to the progress report of the Idaho Committee on the Relation of Electricity to Agriculture.

The report shows further a close correspondence between irrigation and the use of electricity on the farms. In other words, the report shows that the use of electricity is greatest on irrigated farms, not so great in the semi-dry areas, by which are meant the north Idaho wheat region, and sparse in the dry farm areas.

The total number of rural consumers receiving power in Idaho is reported by the thirty-six power companies of the state to be 7,006, served by 1,259 miles of rural distribution lines.

"The irrigation pumping load," states the report, "is a special factor in the rural use of electricity in Idaho. A large part of the total power utilized in the state is supplied to irrigation pumping. . . . The high-tension lines (to supply these units) running across the farm make it possible to install small substations to supply rural distribution lines."

To illustrate the use of power on the farms in southwest Idaho the following table of rural statistics, summarized for the region, is printed in the report:

Number of consumers	3,981
Miles of rural line	618
Total acreage	160,500
Acreage cultivated	134,350
Hp. of domestic motors	1,095
Hp. of irrigation motors	2,096
Other power	2,039
Ranges	693
Water heaters	280
Washing machines	1,994
Irons	3,205
Vacuum cleaners	840
Percolators	182
Toasters	323
Grills and plates	373
Waffle irons	119
Ironers	8
Battery charging rectifiers	8
Sewing machines	91
Air heaters	120

Electrically Driven Ferry Boat Launched at Oakland, Calif.

The Key System Transit Company's electric-drive ferry boat Peralta was launched from the Moore Dry Dock Company's yard in Oakland, Calif., Oct. 14. The vessel is the first of two sister ships to be launched; the second is to be known as the Yerba Buena.

The boats have an over-all length of 276 ft., a breadth over guards of 70 ft., and a molded depth of 21 ft. The designed speed is 14.5 knots normal and 15 knots maximum. These boats are claimed to be the largest direct-current, electrically driven ferries ever built, there being installed in each two 2,600-shaft-hp. electric motors, supplied with power from a single turbine-generator unit, which also supplies necessary power for auxiliaries, light, control system and other uses.

The Westinghouse Electric & Manufacturing Company is supplying the complete electrical machinery throughout for each vessel. The boats will be controlled from the pilot house, the pilot having full control of the main motors at all times. There will be located in the engine room an emergency control stand for operation similar to that located in the pilot house, in the event that it is desired to control the ship from the engine room as is done on the ordinary vessel.

Most of the auxiliaries will be driven by enclosed self-ventilated motors with the new type "sealed sleeve bearings." Auxiliary controllers will be of the magnetic push-button type, the contactor panels being enclosed in drip-proof cabinets. Electrically driven steering gears that will operate both rudders at one time from either pilot house are a new and interesting feature in connection with this installation.

The Peralta was named in honor of one of the early California families and was sponsored by Mrs. Herminia Peralta Dargie, a member of that family.

Utah Engineering Council Issues Official Publication

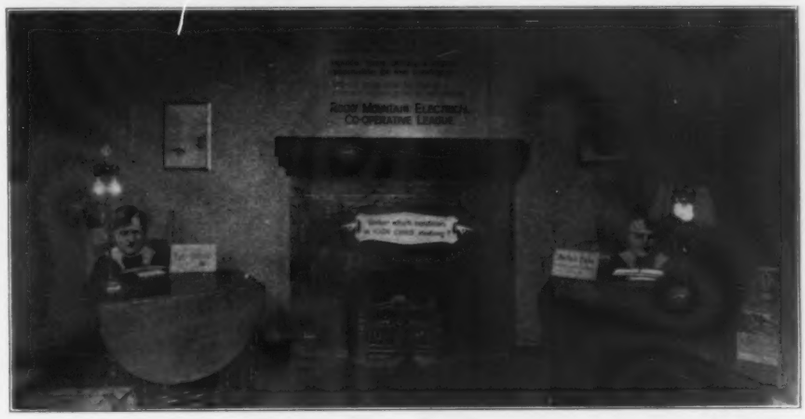
With the October number The Utah Engineer, official publication of the Engineering Council of Utah, makes its initial appearance. Its purpose, as stated in the foreword, is "to cultivate a spirit of mutual helpfulness, individually and collectively, in the engineering fraternity of the state of Utah, and to furnish a medium of contact through which we may all express our views on subjects of common interest."

Ralf R. Woolley, in charge of the United States Geological Survey in Salt Lake City, is editor, and M. L. Cummings, Jr., of the Utah Power & Light Company and editor of its house organ, The Synchronizer, is managing editor. The office of the publication is 624 Kearns Building, Salt Lake City.

Los Angeles Gas and Electric Corporation Authorized to Issue Stock.—Los Angeles Gas and Electric Corporation has been authorized by the California Railroad Commission to issue and sell, at not less than par, on or before June 30, 1927, $1,500,000 of its common capital stock, and to use the proceeds to reimburse its treasury and finance in part the cost of extensions and betterments.

League's Booth at Fair Stresses Proper Home Lighting

The Rocky Mountain Electrical Co-operative League conveyed the message of eyesight conservation through proper home lighting in its exhibit at the Utah State Fair held recently at Salt Lake City. As shown in the accompanying illustration, the display presented a contrast as between proper and improper lighting in the home, especially as it concerned the pupil who must do some of his studying at home. As the fair visitor approached this exhibit he saw one boy (in cut-out design) whose face told the story of eyestrain, studying under glaring lights, while in the other corner was a youngster apparently at perfect ease, with the proper light provided for his study efforts. The contrast was very striking, and placards, in which brief copy was used, posted inside the room, helped to bring out the point at first glance.



The contrast between proper and improper lighting and the effect of each were presented graphically by the exhibit of the Rocky Mountain Electrical Co-operative League at the recent Utah State Fair

A small amount of copy also was used on the front of the booth, further to convey the message of eyesight conservation through better home lighting.

Grant of License on Pine Creek, Wyo., Held Hopeful Sign

The action of the Federal Power Commission in granting a license to the Best Flume & Power Company on Pine Creek at Pinedale, Wyo., has given rise to hope among those interested in other projects on the remote tributaries of the Colorado. Pine Creek is an upper tributary of Green River.

The commission last year adopted a resolution declaring its intention to take no action on projects in the Colorado River Valley. The idea was to give the states in the basin a further opportunity to work out an agreement as to the use of the waters of the Colorado and its tributaries. A number of projects and contemplated developments which have no direct bearing on the Colorado River controversy feel that they should not come within the scope of the resolutino. It seems probable that the commission will consider separately any such project and there always is the possibility that it will tire of waiting on action by the states and may withdraw its resolution.

Erection of Public Service Building in Portland to Start Immediately

Construction of the new Public Service Building, to house the offices and salesrooms of the Pacific Power & Light Company, Northwestern Electric Company and Portland Gas & Coke Company, Portland (Journal of Electricity, Feb. 1, 1926, p. 112), is to start at once, according to announcement made recently by Guy T. Talbot, president of those companiese, coincident with the letting of the contract for over $1,500,000. The building, which will be fifteen and one-half stories in height, will occupy the half-block on the east side of Sixth Street between Taylor and Salmon Streets.

The three companies will occupy all but six floors of the building, including the ground floor and two basements. One basement will house a new large substation of the Northwestern Electric Company. The ground floor will be divided between the Northwestern Electric Company and the

Artist's drawing of 15-story Public Service Building to be erected in Portland for the Pacific Power & Light Company, Northwestern Electric Company, and Portland Gas & Coke Company

Portland Gas & Coke Company principally for appliance display rooms and for the convenience of customers paying bills. The entire third floor is to be given over to facilities for the employees of all three companies and will contain recreation and rest rooms, an assembly room, a library, a restaurant, and an emergency hospital. Six floors will be available for rent by the general public.

The building, which will be the tallest in Portland, is of Italian Renaissance style, with marble floors and wainscoting in the corridors. The spacious lobby will be of marble with an ornamental ceiling. It will be of concrete and steel construction, will have a green tile roof, and will be faced with terra cotta and granite brick. Five of the latest type of signal control elevators, with a speed of 800 ft. per minte, will provide traffic facilities in the building. The first two floors will extend over the entire half-block, and the remaining thirteen and one-half floors will occupy the central 100 ft. of the property, thus creating a tower-like effect. When the future demands it the side wings may be extended upward to the height of the twelfth floor without destroying the architectural beauty of the building. It was designed by A. E. Doyle, architect, and the contract has been let to L. H. Hoffman, contractor, both of Portland.

Utility Plans 13-kv. Line to Supply Tahoe Territory

Authorization has been granted by the California Railroad Commission to the Truckee River Power Company, Reno, Nev., to exercise the rights under a franchise for which it has applied to the Board of Supervisors of Placer County, if that franchise is granted by the supervisors.

The power company has been operating a public utility to a comparatively limited extent in California east of the summit of the Sierra Nevada adjacent to the Nevada state line, and it now proposes to construct a 13,000-volt line from its substation at Truckee southerly to Tahoe City on the north shore of Lake Tahoe with branch lines in both directions along the shores of the lake as far as Brockway on the north and Meeks Bay on the south, in order to supply electric service to hotels, resorts and summer homes adjacent to Lake Tahoe.

Other actions taken by the commission recently include the following: authorization to the Great Western Power Company of California to sell and the Pacific Gas and Electric Company to purchase and operate an electrical distributing line and appurtenances in the Seaside and Pescadero school districts in San Mateo County; authorization to the Lake County Water & Power Company, operating a hydroelectric plant which serves energy for light and power in Kelseyville and adjacent territory, to sell its system to the California Telephone & Light Company; authorization to the Alturas Electric Power Company and the Mendocino Electric Light & Power Company to sell and transfer their properties to the Peoples California Hydro-Electric Corporation.

Salmon River Company Bought by Idaho Power Company

Purchase of the Salmon River Light & Power Company of Salmon, by interests allied with the Idaho Power Company, of Boise, Idaho, has been announced. The property includes a diversion dam on Lemhi River, generating equipment and transmission lines to serve the town of Salmon and mining properties in Salmon.

Ralph Irvine, manager of the Salmon River company, will be retained in that capacity. About $100,000 was involved in the deal, it was stated.

The addition of the Salmon, Livingston, Red Bird and Leadore mining districts to the system of the Idaho Power Company, as well as a rapidly developing agricultural district, is the feature of the transfer of this property.

Position of Chief Plant Engineer Open in Philippines

The U. S. Civil Service Commission has announced an open competitive examination for the position of chief plant engineer to fill a vacancy in the Quartermaster Corps, Fort Mills, Philippine Islands, at $3,600 a year and quarters, and vacancies occurring in positions requiring similar qualifications at this or higher or lower salaries. Applicants must hold a degree in electrical or mechanical engineering and have at least four years of progressive professional engineering experience, including at least two years in responsible charge of the installation or operation of steam and electric power plant equipment.

The duties are: to be in responsible charge of the operation of a large power, electric and refrigeration plant located on Corregidor Island; to supervise construction and repair work on the plant; to superintend the work of maintenance and operation of the water systems. The work involves the direction of a fairly large force of workmen, including prison labor.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil service examiners at the post office or customhouse in any city. Applications must be on file at Washington, D. C., not later than Dec. 7

Frigidaire Separated from Delco Light by General Motors

Recognition of the importance of the electric refrigerator industry has been made by the General Motors Corporation by creation of a new subsidiary, Frigidaire Corporation. This corporation will in the future have charge of the distribution and sale of all electric refrigerator products sold under the trade name "Frigidaire."

During the past year Frigidaire sales have grown from a very modest figure to a point where they surpass in volume certain other members of the General Motors family with every indication that they may climb still higher in the near future.

In creating this new subsidiary Frigidaire has been completely separated from the parent unit, the Delco Light Company, giving it all the factory space previously occupied by the Delco Light Company and placing it on what amounts to terms of equality with the corporation's automobile factories.

The new corporation is headed by E. G. Biechler, president and general manager.

Under the new plan of operation Frigidaire Corporation will have two factories with a total of 53 acres of floor space in use or under construction, which will give it a capacity of 50,000 electric refrigerators a month.

Frigidaire Corporation is now engaged in extensive organization effort, reassigning quotas, building up its selling force and planning a still more extensive advertising campaign for 1927.

B. C. Company Opens New Chilliwack Store.—The British Columbia Electric Railway Company, Ltd., Vancouver, has opened an up-to-date electrical salesroom at Five Roads in Chilliwack.

Electrical Manufacturers Form National Association

National Electrical Manufacturers Association is the name of an organization consisting of 270 leading electrical manufacturers formed recently in New York following the merging of the Electric Power Club, the Associated Manufacturers of Electrical Supplies, and the Electrical Manufacturers Council. Gerard Swope, president, General Electric Company, was elected president of the new association, and J. W. Perry, vice-president, Johns-Manville, Inc., treasurer.

The general purpose of the new association is to advance the art of manufacturing adequate and reliable electrical equipment. A very important consideration is the standardization of electrical apparatus, which ultimately will mean lower costs and lower selling prices to the public, and cooperation with the Department of Commerce in its constructive work, not only in standardization but also in its work of simplification.

Specifically, the objects of the new association, according to its constitution, are to further the interests of the makers of electric apparatus and supplies in manufacturing, engineering, safety, transportation and other industrial problems; to promote the standardization of electrical apparatus and supplies; to collect and disseminate information of value to its members or to the public; to appear for its members before legislative committees, governmental bureaus and other bodies in regard to matters affecting the industry; to promote a spirit of cooperation among its members for the improved production, proper use and increased distribution of electrical apparatus and supplies.

Columbia Basin Financing Plan Being Worked Out

A definite plan for financing development of the Columbia River basin is being worked out by Washington state interests, according to Herbert Hoover, Secretary of Commerce, who spent more than a week in that section during his recent Western trip. The plan will include ultimate irrigation of some 12,000,000 acres of land as well as power development.

Secretary Hoover said that he believes the irrigation works in the Columbia Basin can be handled with approximately $125,000,000 as a revolving fund, as the land will pay its way as opened to cuultivation gradually. The work would require ten years time, the Secretary said, and by the end of that period the growth in population would make it profitable to put the area into cultivation.

California Utility to Enlarge Spring Gap Plant

The Sierra & San Francisco Power Company has applied to the Federal Power Commission for a license to cover its constructed Spring Gap project in the Stanislaus National Forest in California. The plant was constructed under a permit issued by the Department of Agriculture. As it now is desired to expand and reconstruct it, it is necessary to take out a license under the Water Power Act. The dam at Big Dam is to be rebuilt and enlarged, as is the dam at the New Strawberry reservoir. The Herring Creek diversion dam and canal are to be reconstructed. The Philadelphia ditch and penstock are to be enlarged and the capacity of the Spring Gap power house is to be doubled. The license also is to cover a transmission line from the power house at Spring Gap to the power house on the Middle and South Forks of the Stanislaus River. After enlargement the project will have an installed capacity of 19,000 hp.

The California Railroad Commission has granted a certificate to the company and to the Pacific Gas and Electric Company, lessee, authorizing enlargement of the Spring Gap power plant at a cost of $1,950,000. Under the proposed plans the output of the plant will be increased to 55,000,000 kw-hr. per year.

P.C.E.A. Commercial Section Plans Big Conclave

Two or three national figures in central-station merchandising fields will speak on the program of the general conclave of the Commercial Section of the Pacific Coast Electrical Association to be held at the Casa del Rey Hotel, Santa Cruz, Calif., Nov. 12-13, 1926.

The Commercial Section at this meeting will adopt a new policy for such meetings in that one general session with several outstanding speakers will be held in addiiton to the many committee meetings. It is planned to make the coming meeting the largest in the history of the section, and an open invitation to all members of the industry interested in commercial subjects has been issued. At the present time it is planned to hold the general meeting on the afternoon of Friday, Nov. 12. The program is in charge of H. K. Griffin, Western States Gas & Electric Company, section chairman.

File for Power on Wind River for Industrial Uses

Filings for 600 sec.-ft. of the flow of Wind River, a tributary to the Columbia River in the Cascade Range along the southern border of Washington for a $250,000 power plant have been placed with the state hydraulic office, by W. H. Hufford, of Stevenson, Wash.

The plant would have, it is proposed, an output of 10,000 continuous electrical horsepower, although actual construction work would not be undertaken for one year. The point of diversion would be approximately eight miles northeast of Stevenson, Wash., and the appropriated water would be conducted in a 4,600-ft. pipe line to the power house. The necessary dam would be of concrete, steel, reinforced 150 ft. along the top, with other measurements given as 40 and 60 ft.

Such of the output not required for manufacturing by the operating plant would be sold to private consumers, according to a limitation included in the application.

Enlargement of Big Meadows Dam Is Nearing Completion

The enlargement of Big Meadows dam in Plumas County, Calif., at a cost of nearly $2,000,000, creating the immense Lake Almanor reservoir of the Great Western Power Company of California, is nearing completion rapidly. Less than 150,000 cu.yd. of hydraulic fill, remains to be placed in the main body of the dam and this, together with riprapping the upstream face of the structure, is expected to be finished by December. The run-off from a 500-sq.-mi. watershed is to be stored behind the new dam this winter.

Work has been actively under way at Big Meadows for the past eighteen months, and a large force of men steadily has been building up the new dam which will increase the storage capacity of the reservoir from 300,000 to 1,300,000 acre-ft. The old dam is being raised from a height of 90 ft. above stream bed to 135 ft.; its thickness extended from 470 ft. to 1,200 ft. and its length increased from 600 ft. to 1,270 ft. The enlarged dam will flood 47 sq.mi.

With the immense storage capacity of the enlarged Lake Almanor, the Great Western Power Company's electric project on the North Fork of the Feather River has a potential development of 1,000,000 hp. Two plants, Caribou and Las Plumas, are now in operation with a combined capacity of 175,000 hp., and eventually eight more plants will be constructed at strategic points, using the stored waters of Lake Almanor over and over again at various heads.

B.C. Paper Company Adds Million Dollar Equipment to Plant

New hydroelectric equipment amounting to $1,000,000 has been added to the power plant of the Powell River Company. This company, started as a power company at Powell River on the Straits of Malaspina, 75 miles north of Vancouver, B. C., some fourteen years ago and later changed into a pulp and paper factory, on Oct. 6 put into operation new units with a capacity of 200 tons of newsprint per day. The cost of these units which bring the rated capacity of the plant up to 450 tons per day, is set at $8,000,000.

The complete electric plant now consists of one 12,000-kva., two 3,750-kva., and two 2,800-kva. generators driven by water turbines and an auxiliary plant of two 1,200-kva. generators driven by steam turbines, for use during periods of water shortage. The current from the auxiliary plant is transmitted to the main hydroelectric station for distribution. The current from the main plant is transmitted to the mill at 2,200 volts and is stepped down at different points to the requirments of the several individual motors that are distributed throughout the plant. Besides hydroelectric power, 26,000 hp. is developed by a series of Pelton wheels that are geared directly to pulp grinders.

The Hon. T. D. Pattullo, minister of lands for British Columbia, threw in the switch that put the new units into operation in the presence of the lieutenant-governor and a large assembly of prominent business and political men of the Province, who were the guests of the president, Dr. D. F. Brooks.

World Power Conference Stimulus to Power Development

The quantity and the effectiveness of power development is certain to increase as a result of the meetings held under the auspices of the World Power Conference, in the opinion of O. C. Merrill, secretary of the Federal Power Commission. Mr. Merrill, chairman of the American committee and American member of the international executive committee, recently returned from the second meeting of the organization held at Basle, Switzerland, Aug. 31-Sept. 8. It was attended by some 700 representatives from 38 different countries.

In a statement made upon his return Mr. Merrill said in part:

The program of the Basle meeting covered five main topics: Utilization of Water Power, and Inland Navigation; Exchange of Electrical Energy Between Countries; The Economic Relation Between Electrical Energy Produced Hydraulically and Electrical Energy Produced Thermally; Conditions Under Which the Two Systems Can Work Together with Advantage; Electricity in Agriculture; and Railway Electrification, under each of which papers were presented by some member of the American committee. More than 100 papers in all were submitted from the various countries. No papers were read in full at the meetings, but the abstracts of the special subject under discussion were presented by reporters, and genral discussion followd. The sessions were well attended, there was great interest in and active discussion of the various subjects, and altogether the conference was a pronounced success.

The meeting at Basle this year, supplementing the meeting at London in 1924, has demonstrated the value of such gatherings and the desirability of making the conference a permanent factor in international relations. The exchange of information and the opportunity to study and compare the methods employed by various countries, have given added stimulus to power development and have already been reflected in the steps taken by several countries to increase the quantity and improve the efficiency of their power developments.

New Street-Lighting System Put in Effect in San Diego

The first unit of a new street lighting system in San Diego, Calif., on Broadway from Third Street to Eighth, recently was put in operation. The standards are number 1944 Union Metal, with a 20-ft. mounting height, two Form 9-8 panel lantern type units and 10,000-lumen lamps on each. This gives 600 lumens per linear foot of street and compares very favorably with the best lighted streets in America. Westinghouse safety coils are used and are so arranged that 15,000-lumen lamps can be used when desired.

When the second unit is installed the street will be lighted with the new type of illumination from the extreme lower end of Broadway in the downtown city proper to the entrance aveues to San Diego from the north.

The new system replaces five-light cluster lamp-posts which had been in use for many years.

Farmers Protest Taking of Water for Cushman Final Unit

A group of forty farmers and ranchers living in the valley of the South Fork of the Skokomish River in the Hoods Canal district of the state appeared recently before R. K. Tiffany, state hydraulic supervisor, to protest against the proposed move of the city of Tacoma in taking 600 sec.-ft. of water from the stream for the final unit of the $6,000,000 Lake Cushman power project.

The water, they pointed out, would not be returned to the South Fork of the stream but would be conducted by a conduit four miles under a mountain to the present power house of that portion of the project recently placed in operation, with the result that the area of approximately 3,000 acres below the proposed point of diversion would be left barren and worthless.

The answer of Commissioner Ira S. Davisson and J. L. Stannard, chief engineer of the Cushman project, appearing for the city of Tacoma, was that numerous small streams tributary to the South Fork of the stream below the proposed point of diversion would serve to preserve the moisture of the area and to preclude possibities of its being necessary to put in expensive irrigation systems.

Decision on the matter was reserved by Mr. Tiffany until he could make a personal trip of inspection over the area which would be affected by the proposed diversion of the water.

Membership in Utility Employees' Insurance Fund Doubled

On Aug. 31 of this year the number of employees who are members of the Employees' Mutual Life Insurance Fund of the Los Angeles Gas and Electric Corporation was exactly twice what it was in June, 1921, when the organization was started.

The membership in the Insurance Fund is purely voluntary and is open to all employees under the age of 50 at the time of application who have successfully passed the usual company medical examination and are in good health. The corporation assists the fund to the extent of bearing all operating costs, so that a beneficiary receives the entire proceeds of the assessment of a dollar levied upon the occasion of the death of any member.

To date a total of 57 death claims have been paid by the Insurance Fund since the time of its inception. This has entailed a total disbursement of $83,489, or an average payment to beneficiaries of $1,464.72. The cost per thousand dollars of protection is now approximately $5.25.

That the organization has been growing rapidly during the past five years is evidenced by the following figures:

June 20, 1921	952	members
June 20, 1922	1,082	"
June 20, 1923	1,214	"
June 20, 1924	1,416	"
June 20, 1925	1,711	"
June 20, 1926	1,837	"
Aug. 31, 1926	1,904	"

Coast Firm Takes Over Companies in Spokane and Butte

Announcement has been made by the Fobes Supply Company, which now operates stores in Portland, Seattle, San Francisco and Oakland, that on Oct. 1 it bought the Washington Elecrtic Company, Spokane, and the Montana Electric Company, Butte. The two companies have been owned since their inception, about twenty-three and eighteen years ago, respectively by H. W. Turner, now retired and living at Carmel, Calif.

H. L. Bargion, for many years manager of the two companies, will remain in that position, and their names of course will be changed to that of Fobes Supply Company.

F. N. Averill is president of the Fobes Supply Company with headquarters in Portland.

Book Reviews

ELECTRICAL MACHINE DESIGN

By Alexander Gray, Whit. Sch., M. Sc., Professor of Electrical Engineering, Cornell University, Author of Principles and Practices of Electrical Engineering. Revised by P. M. Lincoln, Director of the School of Electrical Engineering, Cornell University. Second edition, 1926. 523 pages; 339 illustrations; numerous tables. 6x9 in. Cloth-bound. Published by McGraw-Hill Book Co., Inc., New York City. Price $5.

Like many other works of this nature the subject matter of this book has been developed from an original form compiled as a course of lectures on electrical machine design. The first edition of this work appeared in September, 1912, while the revision bears the date of August, 1926.

The book is divided into four main subdivisions comprising a total of 43 chapters. These major subdivisions deal with d.c. machinery, alternators and synchronous motors, polyphase induction motors, and transformers. The several chapters included in each of the subdivisions deal with important phases of the problem. In each case the treatment is based upon the fundamental principles involved. The text contains data that the author found of particular use in his several years as a designer of electrical apparatus. In the belief of the author study of design is of the utmost importance to all electrical engineering students and only by such study can a knowledge of the limitations of electrical machines be acquired. The text is built upon this fundamental premise and should be of value to students of engineering design.

The revised edition contains all of the fundamental discussions originally included by the author and in addition a modification of the example machines discussed in the text and a modification of the curves, tables, inllustrations and other data, bringing them up to present-day practice. G.R.H.

Lighting Service Manual—Serial Report of the lighting service committee, 1926-1927, Commercial National Section, N.E.L.A. In the introduction it is explained that, inasmuch as the committee was formed for the purpose of aiding electric service companies in promoting their lighting service activities, it was felt that the preparation of a manual for lighting service departments should be the first step in the committee's program. The manual is designed to give information concerning the proper organization and operation of such a department. The manual, when complete, will consist of the following sections, the first five of which are published in the report just issued: 1. The Lighting Field; 2. Organization; 3. Activities; 4. Equipment; 5. Engineering; 6. Sales Aids; 7. Campaigns; 8. Records and Reports. The report also contains Appendix A, Use of Standard Paragraphs, and Appendix B, Foot-Candle Tables. Price 55 cents; to members 35 cents; quantity prices for 10 or more on request.

News Briefs

Steady Progress Being Made on Pit 4 Project.—Work on the Pacific Gas and Electric Company's Pit 4 power plant is going forward steadily, with 250 men on the job. The temporary diversion dam and flume were completed some time ago. Excavation for the foundations of the permanent dam now is finished, and a considerable portion of the base has been concreted. Pouring of concrete in the section in the river bed will be the next step.

Power Project Planned for Merced River in California.—A proposed hydroelectric power project to develop 13,750 hp. is revealed by the filing with the California Division of Water Rights of an application for permission to divert 2,000 sec.-ft. of water from the Merced River in Mariposa County, Calif. Plans include construction of a dam 80 ft. high, 1,000 ft. long at the crest and 200 ft. at the base. The application was filed by Daniel McFarland of Storrie, and the estimated cost is set at $400,000.

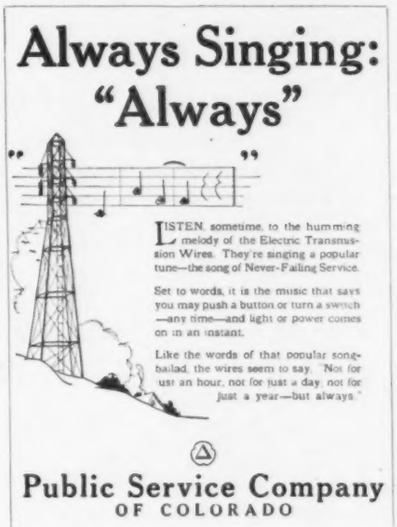
Studies Munipical Plants.—Prof. W. C. Duvall, head of the department of electrical engineering at the University of Colorado, spent the summer studying municipally owned power plants in Colorado and western Nebraska. This was the second summer that he has been engaged in similar work, acting for the Utilities Information Bureau of Denver. His surveys include an inspection and study of all phases of the operations affected. As a result of his work in 1925, several municipal properties were purchased by the Public Service Company of Colorado.

Hearing Held in Los Angeles to Determine Compensation for Recently Acquired Electric Distribution Systems. A hearing to determine the compensation to be paid by the city of Los Angeles for certain electric distributing systems acquired from the Southern California Edison Company was held in Los Angeles Sept. 27-Oct. 1, inclusive. At this hearing evidence was presented concerning tangible values only of the property involved. The hearing will be continued Nov. 2. The properties affected are all in the territories which recently have been annexed to the city of Los Angeles.

Federal Power Commission Exacts from Los Angeles County Flood Control District Stipulation Covering Future Development.—If the Los Angeles County Flood Control District will execute a stipulation covering the possible future development of power by the district, or by others with its consent, in connection with its proposed flood-control project on San Gabriel River, the Federal Power Commission will grant the necessary rights-of-way coming within its jurisdiction. At a meeting of the commission on Aug. 19 the commission took the view that the proposed use of the reservoir for the main purpose of flood control and irrigation is consistent with the most beneficial development of water resources and committed itself to grant the right-of-way under the condition mentioned.

Liberty Bell Monument at Sesquicentennial Exposition Has 25,000 Lamps.—The Liberty Bell monument which spans the main entrance to the Sesquicentennial Exposition in Philadelphia contains 25,000 Mazda lamps. The illumination of the monument was designed and created by the Westinghouse Lamp Company.

Report on Two Utility Companies of Utah Filed.—Report of the Western States Utilities Company of Morgan, Utah, covering nine months' operations of the Morgan Electric Light & Power Company and three months' operations of the Western State Utilities Company in 1925, recently was filed with the Public Utilities Commission of Utah. Total operating revenues for the two organizations for the year are listed at $16,338.04, with total operating expenses of $10,695.24. The operating income is listed at $5,250.16.


Always Singing:
"Always"
"
"
LISTEN sometime, to the humming melody of the Electric Transmission Wires. They're singing a popular tune—the song of Never-Failing Service.
Set to words, it is the music that says you may push a button or turn a switch —any time—and light or power comes on in an instant.
Like the words of that popular song-ballad, the wires seem to say, "Not for just an hour, not for just a day, not for just a year—but always."
Public Service Company
OF COLORADO

Capitalizing upon a popular song, E. K. Hartzell of the advertising and public relations department of the Public Service Company of Colorado, grasped the opportunity to direct the attention of the public to the continuity of service rendered by that company. The advertisement recently occupied a 3-column, 8-in. space in a number of Colorado newspapers.

Mount Spokane Power Company Expands.—Completion of new penstocks 375 ft. long for the Mount Spokane Power Company at its generating station north of Spokane, Wash., and the erection of a new concrete power house, have been announced by M. F. Mendenhall, president. A new transmission line into Clover Valley also has been constructed this summer. The company has expanded to serve ten towns of the eastern Washington district, and reports an increase of 60 per cent in power sold and 113 per cent in merchandise.

More Hetch Hetchy Contracts Let.—Contracts totaling more than $2,000,000 have been let by the Board of Public Works of San Francisco for tunnel work in connection with the Hetch Hetchy water supply project. The A. Guthrie Company of Portland, Ore., was awarded a contract for the construction of the Rock River and Oakdale sections of tunnel for $1,257,952 and T. E. Connelly and J. M. de Lucca of San Francisco were awarded the contract for the Brown section of the tunnel for $779,745.

Japan Proposes 220-kv. Transmission Network.—Proposals have been made in Japan that a 300-mile trunk transmission line operating at 220-kv. be constructed between the cities of Osaka and Fukushima on the Island of Nippon, according to the Japanese technical press. The line would be so constructed as to connect all of the large hydroelectric generating and distributing compaines in the densely populated area between Tokyo and Osaka as well as the province of Fukushima to the north of the former city where considerable energy is generated.

Panama Canal Commission Awards Contract for Engines for Oil-Electric Tugs.—The Panama Canal Commission has awarded a contract to the Ingersoll-Rand Company for four 480-hp., 6-cylinder, 15 x 20, solid injection marine oil engines for installation in two oil-electric tugs which soon are to be built at the Balboa shops for service on the Panama Canal. One of these will be assigned to the marine division on the Pacific Coast for towing large vessels into and out of the entrance to the canal. The other tug will be used by the dredging division for servicing the dredging operations in the various parts of the canal.

Cafeteria Installed by Utility for Employees.—The Los Angeles Gas and Electric Corporation is completing the installation of a modern cateteria on the twelfth floor of its main office building in Los Angeles. The new cafeteria will be completely equipped with every facility for the serving of plain and fancy food, which will be provided at as low prices as possible. The kitchen will have a hotel range, modern refrigeration plant, electric dishwasher and all other necessary equipment to make it complete in every way. The new cafeteria, while chiefly for the convenience and accommodation of employees in the main offices of the company, will be open to all employees in every department as well.

Power Possibilities of Shuswap River in British Columbia Surveyed.—A survey of the Shuswap River power possibilities recently was made by Clifford Planche, a hydroelectric engineer of Montreal with a view to the erection of a plant to supply power and light to towns and farms in the Okanogan district of British Columbia. The Okanogan Valley is in the dry belt, having an annual rainfall of about 10 in. The main object of the power plant, if erected, would be to supply power to farms, in order that water may be pumped for irrigation. The Montreal Trust Company is behind the venture.

Southern California Utility Passes 100,000 Mark.—The San Diego Consolidated Gas & Electric Company has passed an important milestone in its progress, having acquired 100,000 gas and electric customers, according to W. F. Raber, vice-president and general manager. On Jan. 1, 1926, the company was serving 96,620 gas and electric customers. Now it is serving 101,839 customers.

East Kootenay Company Plans New Steam Plant.—The East Kootenay Power & Light Company of Fernie, B. C., is planning the erection of a steam plant at Crow's Nest Lake. The company has hydro plants at Bull River and Elko Falls rated at 22,000 hp., and 40,000 hp. more is said to be available.

Pacific Coast Electrical Association

P.C.E.A. Committee Personnel for 1926-27 Announced

Internal organization of the various sections, committees and subcommittees is practically completed. Honors again go to the Engineering Section for the earliest and most complete organization. The Commercial Section plans to complete its organization at meetings to be held early in November. Listings of the Commercial Section committees therefore are held over for a subsequent issue of the Journal.

Committee personnel as released by the offices of the secretary of the association Oct. 15 is as follows:

GENERAL OFFICERS

S. Waldo Coleman, Pres., Coast Co. G. & E. Co.
W. L. Frost, 1st V.-P., So. Cal. Ed. Co.
P. M. Downing, 2nd V.-Pres., P. G. and E. Co.
J. F. Pollard, Treas., Coast Val. G. & E. Co.
S. H. Taylor, Sec., 447 Sutter St., San Francisco

GENERAL EXECUTIVE COMMITTEE

William Baurhyte, L. A. G. & E. Corp.
F. E. Boyd, G. E. Co.
R. A. Sharon, Gr. Western Pwr. Co.
A. E. Holloway, S. D. Cons. G. & E. Co.
F. O. Dolson, So. Sierras Pwr. Co.
A. M. Frost, S. J. L. & P. Corp.
D. E. Harris, Pac. States Elect. Co.
G. E. Arbogast, Newbery Elect. Co.
C. T. Hutchinson, McGraw-Hill Co.
C. E. Heise, Westinghouse E. & M. Co.
R. E. Fisher, P. G. and E. Co.
A. B. Day, L. A. G. & E. Corp.

ACCOUNTING SECTION

EXECUTIVE COMMITTEE

H. S. Barber, So. Sierras Pwr. Co.
J. M. Bourus, S. D. Cons. G. & E. Co.
A. B Carpenter, S. J. L. & P. Corp.
J. A. Cannon, S. D. Cons. G. & E. Co.
P. R. Ferguson, So. Sierras Pwr. Co.
E. W. Hodges, P. G. and E. Co.
E. N. Hoffman, Coast Valleys G. & E. Co.
O. L. Moore, L. A. G. & E. Corp.
L. A. Reynolds, Gr. Western Pwr. Co.
E. N. Simmons, L. A. G. & E. Corp.
C. P. Staal, So. Cal. Ed. Co.
B. B. Stith, Western States G. & E. Co.

CLASSIFICATION OF ACCOUNTS COMMITTEE

P. R. Ferguson, So. Sierras Pwr. Co., chairman.

CUSTOMERS RECORDS COMMITTEE

E. W. Hodges, P. G. and E. Co., chairman.

FIXED CAPITAL COMMITTEE

A. B. Carpenter, S. J. L. & P. Corp., chairman.

GENERAL RECORDS COMMITTEE

B. B. Stith, West. States G. & E. Co., chairman.

PURCHASING AND STOREROOM COMMITTEE

J. M. Bourus, S. D. Cons. G. & E. Co., chairman.

STATISTICS COMMITTEE

E. N. Simmons, L. A. G. & E. Corp., chairman.

ADVERTISING-PUBLICITY SECTION

R. E. Smith, So. Cal. Ed. Co., chairman.
J. C. Jordan, P. G. and E. Co., vice-chairman.
E. P. Ramsay, L. A. G. & E. Corp., secretary.

INFORMATION COMMITTEE

F. S. Myrtle, P. G. & E. Co., chairman.
S. W. Green, S. J. L. & P. Corp.
C. H. Peirson, So. Cal. Ed. Co.

STANDARDS COMMITTEE

W. A. Cyr, Journal of Elect., chairman.
J. C. Jordan, P. G. and E. Co.
A. C. Joy, S. J. L. & P. Corp.

ENGINEERING SECTION

EXECUTIVE COMMITTEE

J. G. Rollow, L. A. G. & E. Corp., chairman.
C. F. Gilcrest, S.J. L. & P. Corp., vice-chair.
J. W. Andree, So. Cal. Ed. Co.
J. M. Buswell, S. J. L. & P. Corp.
P. E. Chapman, P. G. and E. Co.
L. J. Corbett, P. G. and E. Co.
R. R. Cowles, P. G. and E. Co.
E. J. Crawford, S. J. L. & P. Corp.
P. O. Crawford, Cal. Ore. Pwr. Co.
Walter Dreyer, P. G. and E. Co.
W. R. Frampton, So. Cal. Ed. Co.
J. C. Gaylord, Co. Cal. Ed. Co.
J. M. Gaylord, So. Cal. Ed. Co.
F. R. George, P. G. and E. Co.
A. J. Hall, Ontario Pwr. Co.
R. H. Halpenny, So. Sierras Pwr. Co.
N. B. Hinson, So. Cal. Ed. Co.
R. A. Hopkins, Westinghouse E. & M. Co.
A. G. Jones, G. E. Co.
R. G. Jones, So. Sierras Pwr. Co.
H. N. Kalb, S. J. L. & P. Corp.
H. A. Laidlaw, P. G. and E. Co.
H. Michener, So. Cal. Ed. Co.
G. A. Riley, L. A. Gas. & E. Corp.
M. S. Slaughter, So. Sierras Pwr. Co.
T. W. Snell, Coast Valleys G. & E. Co.
W. R. Van Bokkelen, Coast Counties G. & E. Co.
C. W. Wiggins, S. D. Cons. G. & E. Co.
C. E. Young, P. G. and E. Co.

ACCIDENT PREVENTION COMMITTEE

M. S. Slaughter, So. Sierras Pwr. Co., chairman.
S. M. Bullis, Cal. Ore. Pwr. Co., vice-chairman.
S. C. Dickinson, P. G. and E. Co.
L. L. Dyer, So. Cal. Ed. Co.
P. B. Garrett, Westinghouse E. & M. Co.
C. S. Johann, So. Cal. Ed. Co.
R. G. Jones, So. Sierras Pwr. Co.
D. G. Macey, So. Cal. Ed. Co.
P. F. Melnick, L. A. G. & E. Corp.
W. E. Richmond, S. D. Cons. G. & E. Co.
W. L. Smith, L. A. Bureau Pwr. & Lt.

ELECTRICAL APPARATUS COMMITTEE

H. A. Laidlaw, P. G. & E. Co., chairman.
R. H. Halpenny, So. Sierras Pwr. Co., vice-chair.

Members-at-Large

J. C. Gaylord, So. Cal. Ed. Co.
J. P. Jollyman, P. G. and E. Co.
C. E. Schnell, S. J. L. & P. Corp.
E. R. Stauffacher, So. Cal. Ed. Co.
R. W. Wilkins, P. G. and E. Co.

Company Correspondents

Allis-Chalmers Co., F. H. Searight.
Cal. Ore. Pwr. Co., R. S. Daniels.
Coast Counties G. & E .Co., W .R. VanBokkelen.
Coast Valleys G. & E. Co., T. W. Snell.
Garland-Affolter Eng. Co., P. H. Affolter.
G. E. Co., Los Angeles, J. H. Cunningham.
G. E. Co., San Francisco, M. H. Schnapp.
Grt. Western Pwr. Co., C. F. Benham.
L. A. Bureau Pwr. & Lt., H. H. Cox.
L. A. G. & E. Corp., L. A. Buese.
Ontario Pwr. Co., A. J. Hall.
Pac. Elect. Mfg. Co., E. Sixtus.
P. G. and E. Co., H. T. Sutcliffe.
S. D. Cons. G. & E. Co., K. B. Ayres.
San Francisco Elec. Eng. Dept., P. J. Ost.
S. J. L. & P. Corp., R. D. Likely.
So. Cal. Ed. Co., H. L. Sampson.
So. Sierras Pwr. Co., J. N. Keith.
H. B. Squires Co., S. P. Russell.
Westinghouse E. & M. Co., Los Angeles, R. C. Stackhouse.
Westinghouse E. & M. Co., San Francisco, W. L. Winter.

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Meeting of Executive Committee, P.C.E.A., Called.—An important meeting of the executive committee of the Pacific Coast Electrical Association has been called for Nov. 19 at 2 p.m., to be held in the office of the secretary, 447 Sutter Street, San Francisco.

News of the Electragists

Ben Hill Goes East on Article Five Committee Conference

To go into the revision of article five of the National Electric Code, a meeting of the article five committee was called for Oct. 16, at Atlantic City. Ben Hill, supervising inspector, city of Oakland, Calif., and president of the California Association of Electrical Inspectors, went as the California representative of that committee.

On leaving Mr. Hill commented on the proposed work of the article five committee in seeking to establish a more complete and detailed code which could be used to reduce the number of local requirements to a minimum and practically do away with the necessity for other than the national code.

"I appreciate the responsibility that has been given me as representative of the men in the West," said Mr. Hill, "and I want to assure everyone that I shall go to the meeting to uphold high standards and to establish as a true national standard the National Electrical Code. There shall be no tearing down."

Mr. Hill said that the committee planned to make a careful study, section by section, of the article, make its recommendations to the committee on code revision and then submit for approval.

Upon the completion of the code revision, Mr. Hill declared he was in favor of a much greater educational program to acquaint all interested in the provisions of the code. A man should be selected, in his opinion, to study the code and its interpretations, and take it up in each community for the benefit of all.

Article five is the article on wiring methods, it was pointed out, and the purpose of the present conference is to amplify article five to incorporate in it the "shall and shall not" necessary to give it authority.

"One of the finest things about the arrangements for my going,'" said Mr. Hill, "is that no one of the organizations contributing to my trip has

B. C. HILL

asked me to pledge myself to any sort of program. I have been left to exercise my discretion and to act according to the standards which are highest."

Other members of the article five committee called by W. J. Canada, electrical field secretary for the National Fire Protection Association, chairman of the committee, are Victor H. Towsley, Chicago; L. W. Going, Portland, Ore.; and M. Cannady, inspection department of North Carolina.

Ward Akeley, Inc., well known Long Beach and southern California contractors, have opened offices in Los Angeles at 829 Petroleum Securities Building. **Thomas Hutton** is in charge of the Los Angeles office.

Northwest Inspectors Announce Convention Date Change

Announcement has come from F. D. Webber, secretary of the Northwest Association of Electrical Inspectors, that a mistake has been made in announcing the dates for the next meeting of the association. The meeting will be held Jan. 17 and 18, rather than 18 and 19, as previously announced. This will make the convention run on Monday and Tuesday of that week.

The convention is to be held at the Multnomah Hotel, Portland, Ore.

Clarence Elder, of **Elder Bros. Electric Company,** Salt Lake City, returned recently from an extended trip through the Northwest.

D. D. Sturgeon, Electragist of Denver, and family recently returned to the city after a two weeks' automobile trip to Wyoming.

L. H. Rohrer of the **Valley Electric Company,** Lompoc, spent several days in Los Angeles on business about the first of the month.

The Home Electric Company, formerly at 23rd and Coast Boulevard, Newport Beach, **Calif.,** has moved into a new store at 112 Coast Boulevard.

The Mission Electric Company of Santa Barbara, **Sandy Vahrenkamp,** proprietor, has recently been made a member of the California Electragists, Southern Division.

S. Beck, from the **Central Supply Company,** Denver, and part owner of the **United Electric Supply Company,** was in Salt Lake for about two weeks during the absence of **H. R. Bygel** who was away on vacation.

The McGeary Electric Company, Santa Barbara, has just moved into its new and beautifully equipped electrical store on State Street. This firm has occupied temporary quarters since its former store was wrecked in the earthquake.

The Three Graces—but who's the gentleman? Mrs. Fagan, Mrs. Joseph Fowler, and Mrs. Harry Walker—not to mention Fred Buzzell, of course.

Look like brothers, and are as far as merchandising goes. O. N. Robertson of Santa Ana, and "Kelly" Courtright of Fresno. Their paper started things.

Now you tell one! What chance has the motor man, H. S. (Mike) Jones, between two Electragists, Frank McGinley, of Wilmington, and Earl Browne, San Francisco.

Meetings

Agriculture's Future and Light Topic of U. C. Man's Talk

"The future of American agriculture lies in the lap of the contented and satisfying rural home."

With this statement as his theme, J. P. Fairbank, extension specialist in agricultural engineering, University of California farm school, Davis, explained to the Illuminating Engineering Society at a recent meeting the work of the University Extension Division in carrying the message of good lighting to farm communities.

Since half of the farms in California are served with electricity, the extension division felt it was worth while to give attention to electric lighting on farms, and as a result a demonstration unit, on a portable basis (Journal of Electricity, Jan. 1, 1925, p. 12), carried the practical ideas of good lighting to 150 communities in 32 counties last year. Besides group demonstrations, home demonstrations were made with kitchen-lighting equipment. The kitchen was chosen as the logical place to start a better home-lighting educational campaign. The demand has spread for information regarding lighting of other rooms of the farm home as well.

"Now people are asking us, 'Where can I get such equipment?' and 'How much does it cost?'," said Mr. Fairbank. "We cannot answer that. But the answer to those questions will be what the lighting industry makes it."

"The trouble with home lighting as I see it," Mr. Fairbank continued, "is that lighting fixtures are sold on a millinery basis rather than a sound economical or engineering basis. By millinery basis I mean that the emphasis is placed on its appeal to the eye, to style, and the desire of ownership and nothing to utility.

"We need more lighting units for the home designed for beauty because of their simplicity, produced on a prodution basis instead of custom built so that the cost of good lighting can be reduced to a popular level."

The kitchen-lighting campaign, it was pointed out, was a step in that direction but not far reaching enough. The same kind of campaign was needed for other rooms of the house.

"It will be better for everyone concerned when you can sell three $10 fixtures to a farm home rather than one $30 luminaire that may or may not 'lumen'."

In concluding his talk Mr. Fairbank declared that rural homes wanted good lighting, that they were ready to pay a reasonable price for it, and that they looked to the Illuminating Society for help in getting it for them. Mr. Fairbank had set up his demonstration apparatus and described briefly the means he took to carry his story to his audiences.

Radio Trade Association Elects Officers.—At the recent annual meeting of the Pacific Radio Trade Association in San Francisco, Ernest Ingold, president of Ernest Ingold, Inc., was elected president of the association for the coming year. Mark E. Smith was elected vice-president and W. J. Aschenbrenner secretary-treasurer. The balance of the board of directors includes E. J. Koepke, J. A. Ramsey, Wilbur Jackson, Major Nathan Levinson, E. A. Portal, Robert Eastman and H. W. Dickow.

Sacramento Valley Electrical Society Holds Meeting

At the first meeting of its fall season held by the Sacramento Valley Electrical Society in Sacramento there were sixty-five members of the society present. After the usual banquet an address was delivered by F. W. Bunyon, steel metallurgist of the Southern Pacific Company, on the "The Electric Treatment of Steel." He covered, briefly, the history of the treatment of metals from their earliest use to the electric treatment of today, and made an interesting comparison between open-hearth and electric furnaces as to qualities, costs and material handled. Then followed a tour through the Southern Pacific Company's machine shops and to the 6-ton electric furnace, which was timed so that a "pour" of steel might be witnessed.

Nominations for office were made as follows: President, J. O. Tobey, division superintendent electric department Pacific Gas and Electric Company; secretary, C. S. King, engineer, Great Western Power Company; treasurer, F. P. Bruner, Pacific Gas and Electric Company; directors (1926-1928), H. E. Brillhart, Great Western Power Company; R. J. Finchley, California Mechanical & Electrical Engineering Company; George C. Foss, contractor. Prof. B. D. Moses, of the University of California; Earl Hart, of the Paific Gas and Electric Company; and M. P. Canon, of Latourrette-Fical Company, as directors hold office for another year.

Plans Electrical Course at Washington University.—The Electric Club of Seattle has under serious consideration the establishment of an electrical course at the University of Washington; also a school for lighting, sponsored by the club.

COMING EVENTS

Pacific Coast Electrical Association—

Commercial Section—General Conclave
Casa del Rey Hotel, Santa Cruz, Calif.
Nov. 12-13, 1926

Meeting of Executive Committee
Office of Secretary, 447 Sutter Street, San Francisco
Nov. 19, 1926, at 2 p.m.

Purchasing and Stores Section Meeting
San Francisco, Dec. 2-3, 1926

Advertising-Publicity Section—Quarterly Meeting
Edison Building, Los Angeles
Dec. 3, 1926

Northwest Association of Electrical Inspectors—

Annual Convention—Multnomah Hotel, Portland, Ore.,
Jan. 17-18, 1927

Pacific Division, Electrical Supply Jobbers' Association—

Quarterly Meeting—Hotel Del Monte, Del Monte, Calif.
Jan. 27-29, 1927

Committee Chairmen of Seattle Electric Club Appointed

The following committee chairmen have been appointed by J. D. Ross, president of the Electric Club of Seattle, to serve during the coming year, each chairman to name four committeemen to serve with him:

Finance, J. J. Hayes, Westinghouse Electric & Manufacturing Company; legislative, Sam G. Hepler, Arrow Electric Company; wiring code, J. G. Maitland, Electric Engineering Corporation; membership, Harry J. Martin, National Carbon Company; entertainment, Robert Clark, Puget Sound Power & Light Company; publicity and advertising, Joe Osier, Seattle Journal of Commerce.

Red Seal Meeting at Devonshire.—Under the auspices of the Peninsula Electric Development League a group of 65 electrical contractors, power-company representatives, architects and builders were told the Red Seal story, accompanied with the new "before and after" demonstration, at a meeting held at the Devonshire Country Club, San Carlos, Calif., recently. Ray Turnbull, Edison Electric Appliance Company, was the principal speaker, talking on merchandising opportunities under the Red Seal plan. Victor Hartley, California Electrical Bureau, was in charge of the Red Seal demonstration.

San Diego Electric Club Adopts Appropriate Emblem

The Electric Club of San Diego, Calif., recently adopted the club button shown in the accompanying illustration. For some time the matter of an appropriate emblem has been under consideration and many attractive designs have been submitted. The sketch offered by Ray C. Cavell, president of the club, finally was chosen because of its simple and appropriate design. Several of the emblems suggested, while attractive, were not considered representative of all phases of the industry represented by various members of the club.

This lapel button, recently adopted by the San Diego Electric Club as its emblem, has a blue center field surrounded by a black border with the lettering in gold.

The buttons will be lapel style, three-eighths of an inch in diameter, solid gold, with black field in border and blue field in center. All lettering will be in gold.

Personals

Clyde L. Chamblin, president, California Electrical Construction Company, San Francisco, is the newly elected president of the California Electragists. Prominent for many years in the Electragist branch of the industry, Mr. Chamblin brings to his new position a wide knowledge of that branch's affairs, an understanding of its problems, and a long experience in the contracting business that should be of great benefit to the organization. For the year 1925-1926 he represented the Electragists as a member at large on the executive committee of the National Electric Light Association. Other important posts that he

CLYDE L. CHAMBLIN

has held include that of member of the executive committee of the Association of Electragists, International, director of the Society for Electrical Development, Inc., president of the California Association of Electrical Contractors and Dealers, president of the San Francisco Association of Electrical Contractors and Dealers and member of its executive committee, president of the San Francisco Electrical Development League, and member of the executive committee of the Pacific Coast Electrical Association. At the present time he is serving on the advisory committee of the California Electrical Bureau. With a leader of Mr. Chamblin's qualifications, his familiarity with the affairs not only of the Electragist branch but of the industry as a whole, and his wide acquaintance, great progress should be made by the California Electragists during the coming year.

Merrill C. Morrow, formerly assistant to the general manager of the merchandising department of the Westinghouse Electric & Manufacturing Company, has been appointed assistant sales manager of the same department. In his former position Mr. Morrow was responsible for sales to public utilities. His work now embraces all the activities of the merchandising department. His headquarters will be at the company's plant at Mansfield, Ohio.

Ernest L. Dee, of the Edison Lamp Works, Salt Lake City, not long ago made a business trip through Idaho, Portland, Seattle, Spokane and the Northwest.

C. B. Hawley, of the Intermountain Electric Company, and **J. A. Kahn,** of the Capitol Electric Company, both of Salt Lake City, attended the electrical jobbers' convention, Pacific Coast Division, at Victoria, B. C., in September. They were successful in taking home several cups as a result of their good golf playing.

Roscoe F. Oakes, vice-president and general manager, National Carbon Company, San Francisco, accompanied by Mrs. Oakes, recently spent a month in the Northwest. While in that section he attended the Pacific Coast convention of the Electrical Supply Jobbers Association in Victoria, B. C., and also paid a visit to Seattle.

A. H. Noyes, formerly with the Electric Appliance Company and later with the Westinghouse Electric & Manufacturing Company, both of San Francisco, has joined the staff of Dunham, Carrigan & Hayden in that city as salesman of its electrical lines. He will cover the territory adjacent to San Jose, Calif.

Harold Pomeroy, of J. G. Pomeroy & Company, manufacturers' representatives of Los Angeles, recently left for the East to visit the various factories which that firm represents.

William Wheat, manager of the North Coast Electric Company, Portland, spent two weeks in Seattle not long ago.

E. S. Conrad, Pacific Coast sales manager, Square D Company, San Francisco, spent a week in Seattle a short time ago.

Joseph A. Fowler, president of the Association of Electragists International, was the principal speaker at a recent banquet given in his honor jointly by members of the Electrical League of Colorado and the Denver Electrical Contractors Association. **P. Harry Byrne,** president of the local contractors' association, presided over the meeting and presented the only other speaker, **A. C. Cornell,** league chairman, who spoke briefly on league activities.

C. W. Sward, sales engineer, G. & W. Electric Specialty Company, Chicago, recently spent several days in San Francisco while on a trip through the Pacific Coast states on business.

H. B. Squires, for many years president of the H. B. Squires Company, San Francisco, has sold his entire stockholdings in the firm to S. P. Russell, who has been his partner for a number of years, and terminated his connection with the company Oct. 31. The firm name will remain the same.

D. G. Kendall has been made a member of the board of directors of Brown & Pengilly, Inc., San Francisco, and placed in charge of engineering and sales of the company's northern California division.

H. S. Jones, manager, Robbins & Myers, Inc., San Francisco, has been appointed chairman of the program committee of the Electrical Development Leagne, succeeding **W. B. ("Doc") Francis,** who is leaving the electrical industry to become sales manager of the Ti-iT Machines Company, with headquarters in San Francisco.

H. A. Laidlaw, of the engineering division of the Pacific Gas and Electric Company, employed a unique means of transportation to the P.C.E.A. Engineering Section meeting in Los Angeles in September, traveling there on board one of the ships of the Pacific battle fleet.

Elmer Ambrose Sperry of the Sperry Gyroscope Company, New York, has been awarded the John Fritz gold medal in recognition of his development of the gyroscopic compass and his application of the gyroscope to the stabilization of ships and aeroplanes.

F. M. Feiker, operating vice-president of the Society for Electrical Development, with headquarters in New York, has been appointed by Herbert Hoover, Secretary of Commerce, as a member of the new advisory committee which will co-operate with the domestic commerce division of the United States Department of Commerce.

J. J. Hannemann, district representative in Kansas City for the National Lamp Works of the General Electric Company, has been transferred to the Mountain states territory with headquarters in Denver.

H. L. Duncan, formerly station chief at the Southern California Edison Company's Big Cheek No. 1 plant, has been transferred to the company's main offices in Los Angeles in the department of work orders and budgets. **Eric Sismey,** formerly assistant station chief at Big Creek No. 3, succeeds Mr. Duncan.

A. J. Priest, attorney and secretary of the Idaho Power Company at Boise, Idaho, has severed his professional connection with that company and become associated with the legal department of Electric Bond & Share Company in New York. Matriculating at the University of Idaho in the fall of 1914, Mr. Priest gained his B. A. degree, in advance of graduation, in April, 1918, to enlist in the service, becoming sergeant-instructor at Camp Lewis, Wash., and later going to the

A. J. PRIEST

officers' training camp at Camp Grant, Ill. Having had considerable experience in newspaper work, at the close of war he re-engaged in it until the fall of 1919, when he took the course of law at the University of Idaho and was graduated with honors in June, 1921. He was editor of the university paper, graduate manager of athletics, and a member of Beta Theta Pi, later serving as district chief for a number of years. He resumed his newspaper work for a time and later engaged in the private practice of law, associated with C. C. Cavanah in Boise, and afterward with John F. MacLane in Salt Lake City, Utah, whence he went to the Idaho Power Company in January, 1923. Mr. Priest's active abilities have led him into many branches of public service, to which he has given freely

of his time and energy, as he is intensely interested in all movements for the betterment of surrounding conditions.

Paul S. Clapp, formerly special assistant to Herbert Hoover, Secretary of Commerce, in engineering, economic and commercial problems of the United States, has been appointed managing director of the National Electric Light Association. He succeeds M. H. Aylesworth, who recently resigned to become president of the newly organized National Broadcasting Company, Inc. Mr. Clapp has had an interesting career. Graduated from Iowa State College in 1913 with the degree of B.S. in electrical engineering, he entered the Chicago factory of the Western Electric Company to familiarize himself with factory methods. In February, 1914, he was advanced to the same company's engineering department in New York, remaining there until February, 1917. During that period he assisted in the research work being carried on in connection with trials of the vacuum tube as an oscillator and amplifier. In February, 1917, Mr. Clapp became assistant purchasing agent of the Allied Machinery Corporation, remaining until September of the same year, when he was commissioned a first lieutenant in the U.S.A. Signal Corps and became division signal supply officer of the Thirty-third Division, Camp Logan, Texas. Later, in charge of the field trial and responsible for the final engineering approval of all radio and telegraph apparatus for aeroplanes, tanks and field sets at the radio laboratories at Little Silver, N. J., Mr. Clapp won promotion to a captaincy in

PAUL S. CLAPP

the signal corps. He was sent to France, and among other activities there he served on the Peace Commission in Paris as a member of the committee for the determination of damage in allied countries, became affiliated with the American Relief Administration for central and southeastern Europe, assisted in re-establishing cordial relations in the business interchange of American and western European industries, and under the American Relief Administration supervised a feeding area in Russia containing 470,000 adults and children. Concluding his work with the relief administration in February, 1923, Mr. Clapp traveled in Scandinavia and central Europe and then in Berlin to study languages, customs and conditions. In that year also he was awarded the degree of electrical engineer by Iowa State College.

William M. Green, engineer in charge of the investigation of the Great Basin reclamation project in Utah, on behalf of the U. S. Reclamation Service, has resigned from the service to accept a position with the J. G. White Engineering Corporation in Mexico. This firm is engaged in reclamation work for the Mexican government and private interests.

A. L. Alin of San Francisco has joined the engineering department of The Washington Water Power Company at Spokane. He was formerly with the Foundation Company of New York.

E. T. Hunter, salesman at the Hood River office of the Pacific Power & Light Company for the past year and a half, has resigned to take charge of the electric department of the Kelley Hardware Company.

Edward H. Cheney, who has been Chicago district manager for the Wagner Electric Corporation, St. Louis, since 1909, has been made sales manager of the company in the latter city, succeeding **Thomas T. Richards,** resigned.

W. C. Sterne, president, the Municipal Properties Investing Company, Denver, and president of the Rocky Mountain Division, N.E.L.A., recently returned from a business trip to the Pacific Coast.

W. F. Raber, vice-president and general manager, San Diego Consolidated Gas & Electric Company, was a visitor to San Francisco recently.

L. W. Brownrigg, formerly special representative in Cleveland for the Electric Vacuum Cleaner Company, Inc., of that city, has been appointed division manager for that company in San Francisco. Prior to his connection with the Electric company, Mr. Brownrigg was associated with the National Carbon Company.

F. J. Cram, formerly secretary and assistant manager, Electric Appliance Company, San Francisco, made a trip to Olympia, Wash., recently.

A. H. Kahn has been appointed assistant district manager of the San Francisco office of the Pacific States Electric Company, succeeding **Roy Worth** who is no longer associated with the company.

Lawrence T. Fay, president Fay Rubber Products Company, Elyria, Ohio, lately visited the Pacific Coast on business.

C. R. Breck and R. R. Day, engineers representing the J. G. White Engineering Corporation of New York, have been making a survey of the water power possibilities of Falls River, near Prince Rupert, B. C., and of some of the tributaries of the Skeena River, in northern British Columbia. About a year ago, **Lorne A. Campbell,** general manager for the West Kootenay Power Company, made a survey of Falls River.

W. J. Dodge, since 1923 telephone and telegraph engineer with the California Railroad Commission and for five years prior to that assistant engineer in the gas and electric division of the commission's engineering department, has resigned to become commercial engineer for the Pacific Telephone & Telegraph Company.

Howard Wright, formerly in the claims department of the Puget Sound Power & Light Company, Seattle, has been named safety engineer for the company's southwestern district, succeeding the late **Capt. D. J. Kinzie.**

Obituary

Charles Heston Peirson, assistant vice-president of the Southern California Edison Company, who for eighteen years has had charge of publicity for that organization, died at his home in Los Angeles Oct. 19 from heart failure. "Charlie" Peirson known throughout America as a veteran newspaper man, was born in Batavia, Genesee County, N. Y., March 2, 1859, and began writing for the local weekly paper when he was 12 years old, at the same time serving as messenger boy for the Western Union Telegraph Company. After graduating as a telegraph operator he worked as a re-

CHARLES HESTON PEIRSON

porter for the Buffalo Courier and the Buffalo Times. Answering the call of the metropolis, he joined the staff of the New York Morning Journal. In 1890 he went to work in the New York office of the Associated Press. In the latter capacity he was sent to Havana at the outbreak of the Spanish-American War. He later went to California where he was engaged by the Los Angeles Herald, at that time a morning paper. When the Examiner was started he was made circulation manager. In 1909 Mr. Peirson began his association with the Southern California Edison Company to which he gave all his talent and energy until he was stricken with the illness which resulted in his death. Much of the widespread knowledge of the electrical industry is due to "Charlie" Peirson's facile pen. It was he who made the Florence Lake Tunnel an international story and Jerry's dog team a household phrase. As a free lance writer he contributed both poetry and prose to literary magazines throughout the country. His best known poem is "The New White Coal" also used as a prologue to the well known film of the same title.

Charles A. Porter, substation operator who had been in the employ of the Utah Power & Light Company, Salt Lake City, and its predecessors for the past thirty years, died Sept. 3.

Capt. David J. Kinzie, for the past several years safety engineer for the Puget Sound Power & Light Company, Seattle, in its southwestern district, died Sept. 5.

TRADE NOTES

The Timken Roller Bearing Company, Canton, Ohio, has issued a new Timken Engineering Journal, a loose-leaf book of 110 pages containing technical information relative to the application of Timken bearings to automotive and industrial machinery. Typical problems and their solutions, tables, methods of mounting bearings, a full set of dimension sheets accurately drawn to scale, together with formulas and recommendations for application of Timken bearings are among the subjects treated in the book. Copies may be had upon request.

The Ben Franklin Electric Company, Seattle, Wash., has opened a new store at 1503 Third Avenue, its second store opened since last December. **R. B. Condon** is the local manager.

Wodack Electric Tool Corporation, 23-27 South Jefferson Street, Chicago, has announced its electric hand saw, which weighs but 24 lb., is fitted with a motor large enough to drive an 11-in. circular saw, and still can be operated from the ordinary light socket. The company claims that with its electric hand saw a 4 x 4 timber can be cut in less than two seconds.

"When good fellows get together"—Living picture to illustrate that rollicking old song posed by those good fellows (left to right) H. L. Pinkerton, new business manager, Albuquerque Gas & Electric Company, Albuquerque, N. M.; B. C. J. Wheatlake, manager, General Electric Company, Salt Lake City; G. W. Thomas, power salesman, Public Service Company, Denver; and K. W. Kissick, manager, Deming Ice & Electric Company, Deming, N. M. Note the unstudied pose of the gentlemen at either end and the characteristic golf attitude of the pair in the center.

The Packard Electric Company, Warren, Ohio, recently has issued a leaflet covering its outdoor metering cabinets. These cabinets were developed to go with the company's line of weatherproof metering transformers where it is not convenient or advisable to place meters indoors.

Aladdin Manufacturing Company, Muncie, Ind., manufacturer of desk lights, table lamps, floor lamps, bridge lamps, and similar equipment, has issued an attractive catalog containing many new items of interest to the trade. Copies will be supplied by the company upon request.

The Appleton Electric Company, 1701-13 Wellington Avenue, Chicago, has under construction a new concrete addition to its plant, which will contain 100,000 sq.ft. of floor space and is being built immediately adjoining its present building. The new building will give the company much needed additional floor space required to take care of the rapidly increasing business both in the electrical and automotive field, according to the announcement.

Pittsburgh Transformer Company, Pittsburgh, has prepared Bulletin 2058, "The Largest Self-Cooled Transformers Shipped Complete in the History of the Electrical Industry." This folder describes the 15,000-kva. Pittsburgh polyphase transformers shipped to the New York Edison Company for its East River station.

The Falk Corporation, Milwaukee, Wis., is making a flexible coupling of entirely new design, different from anything it has manufactured previously, according to recent announcement. The construction is very simple, it is claimed, and provides for disconnection of shafts coupled, without disturbing either machine, and alignment is reduced to the simplest operation, demanding only a short straight edge and an ordinary set of feelers. The couplings are made in standard sizes from ⅓ hp. to 30,000 hp. at 100 r.p.m. Bulletins may be obtained from the company upon request.

Roller-Smith Company, New York, has issued Bulletin 550 covering its new Type SR line of relays. They supersede the company's old Imperial Type relays and have many marked advantages over the old type, according to the company. The scales are longer, the accuracy is much greater, the torque has been increased several times and the new 7½-in. round pattern style of case matches Type SA and Type SD lines of indicating instruments. Complete technical details are given in the bulletin.

J. H. Bunnell & Company, Inc., has announced the removal of its factory to new and larger quarters at Pearl and Prospect Streets, Brooklyn, N. Y. The main office and warehouse will remain at 32 Park Place, New York City.

Standard Electric Stove Company, Toledo, manufacturer of Standard electric ranges for domestic use, heavy-duty ranges, hotplates, griddles, cookers, water heaters and coffee urns, has purchased the 3½-acre site at the corner of Oakwood, Hawthorne and New York Central Railway, Toledo. The property will be cleared at once and the erection of a modern factory building begun, according to the company's announcement. The first unit of this building will about double the company's present capacity and is expected to be occupied early in the spring.

Frank Hodson, consulting engineer, Philadelphia, formerly founder and president of the Electric Furnace Construction Company, Philadelphia, advises that he has signed contracts with F. T. Kaelin of Montreal for the exclusive rights to Mr. Kaelin's system, process and patents on the Kaelin electric steam boiler for the United States and South America. Mr. Hodson originally introduced this boiler into the United States for the Electric Furnace Construction Company before it was taken over by the General Furnace Company. The total number of Ktelin electric steam generators now installed is over 500,000 kw., and with the growing development of hydroelectric power their scope and usefulness is constantly increasing, according to the announcement.

Jas. R. Kearney Corporation, manufacturer of overhead and underground utility equipment, 4224-32 Clayton Avenue, St. Louis, Mo., recently has issued a bulletin catalog. The corporation is a new organization and this is its first catalog. Bulletins contained in the catalog cover anchors, plug cutouts, service connectors for light and power service taps, guy wire clips, dead-end eyes, and extension sleeve twisters. A complete catalog or single bulletins as specified may be obtained upon request.

The Washer Wilson, Inc., distributors of electrical appliances, has opened offices in Seattle, with **Russell Brooks** as manager. This is the seventy-fifth branch of the firm, which features Horton Gyrator Washer and Horton Automatic Ironer.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, has issued "Regulators for Generator-Voltage Control," S. P. 1734, a well illustrated booklet covering the following subjects: Regulators for Direct-Current Generators; Vibrating-Type Regulators for Alternating-Current Generators; The Application of D. C. Generators to Exciter Service; Compensation for Voltage Drop and Parallel Operation of Regulators; Rheostatic-Type Regulators for Alternating-Current Generators; Extended Broad-Range Regulators, and Special Regulator Applications.

Square D Company, Detroit, has issued catalog No. 32 which lists not only the company's complete line of industrial switches but includes standardized meter service switches, convertible power panels and electrical porcelain. The book is in loose-leaf form, profusely illustrated and carefully indexed.

Crouse-Hinds Company, Syracuse, N. Y., has issued a broadside on its vapor-proof Condulets, covering its V series, hand lantern and hand lamp, FS, FA, GS, ZT, YW, YKW series and type WV.